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ABSTRACT

This review of the literature related to the cloze procedure includes most of the studies reported from 1953 to 1971. One hundred ninety-eight documents are included and are divided into four categories, studies in which the cloze procedure has been applied (1) as a measure of readability, (2) as a measure of comprehension, (3) as a measure of language facility, and (4) as an instructional technique. An appendix and bibliography are included. (WR)

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BOSTON UNIVERSITY

SCHOOL OF EDUCATION

Thesis

A REVIEW OF THE LITERATURE RELATED TO THE CLOZE PROCEDURE

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To

"The Friends"

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INTRODUCTION

This thesis presents a review of the literature related to the cloze procedure, and includes all the studies reported from 1953 to 1971, the exceptions being those documents unavailable at the time of this writing.

A total of two hundred twenty-two documents were examined. Of these, one hundred ninety-eight were selected as being related in some respect to the cloze procedure. One hundred twenty-six abstracts have been included in the body of the thesis and the remaining seventy-two references have been included in the Appendix.

References in Section I of the Appendix are classified to correspond with the five chapters of the thesis. Section II contains twelve additional references assumed to be of significance but which were unavailable at the time this thesis was prepared.

The Bibliography, a composite of all one hundred twenty-six abstracts, is also classified to correspond with the five chapters.

CHAPTER I

THE CLOZE PROCEDURE: AN OVERVIEW

In 1953 Taylor[1] introduced a technique for measuring readability which he named "the cloze procedure." The name of this new technique was derived from the Gestalt concept of "closure" which hypothesizes that the reader completes a structural whole by filling in a missing gap.

Taylor defines cloze as:

> A method of intercepting a message from a 'transmitter' . . . mutilating its language patterns by deleting parts, and so administering it to 'receivers' . . . that their attempts to make the patterns whole again potentially yield a considerable number of cloze units.[2]

A cloze unit is

> . . . any single occurrence of a successful attempt to reproduce accurately a part deleted from 'a message' . . . by deciding from the context that remains, what the missing part should be.[3]

Although the cloze procedure *per se* is a relatively new concept, word deletion techniques were used by

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[1] Wilson L. Taylor, "'Cloze Procedure': A New Tool for Measuring Readability," *Journal ism Quarterly*, 30 (1953), 414-438.

[2] *Ibid*., 416.

[3] *Ibid*.

Ebbinghaus, as reported by Rankin,[1] in 1897 in the construction of an intelligence test. Applications of the word deletion technique may be observed in several current psychological instruments and in the use of incomplete sentences in measures of scholastic achievement. Vocabulary tests utilize the word deletion technique to determine the reader's sensitivity to context clues. The cloze procedure, however, should not be confused with the latter word deletion techniques.

Omitted words in sentence completion tests and vocabulary tests requiring the use of context clues are determined by the test constructor in terms of specific meaning, context, and the purpose of the test. In contrast, cloze deletions may occur at any point in a continuous passage by means of a specific, objective criterion. Success or failure in predicting omitted words may or may not influence subsequent success or failure. Contextual clues in a cloze test may be far removed from a cloze deletion and not immediately surround it, as they would in a vocabulary test of sensitivity to context clues.

Cloze deletions are made by means of a specific, objective criterion which takes one of two forms: an every "nth" word deletion or the deletion of every word of a particular syntactic type. The former is sometimes referred to as a structural deletion and the latter as a lexical deletion. Structural deletions may be made on the basis of every second, or fifth, or tenth word, for example, or by a more sophisticated randomizing procedure of the researcher's choice. Lexical deletions are usually limited to nouns or verbs, although any syntactic element may be chosen as the deletion criterion. The first and last sentences of the passage are not generally included in the procedure in order to permit the reader to become familiar, to some degree, with the topic of the passage.

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[1] Earl F. Rankin, Jr., "The Cloze Procedure - Its Validity and Utility," Starting and Improving College Reading Programs, ed. by Oscar S. Causey and William Eller, Eighth Yearbook of the National Reading Conference (Milwaukee, Wisconsin: National Reading Conference, 1959), pp. 131-144.

Deleted words are replaced by a blank line of standard length. Scoring is computed on the basis of either the number of correct exact replacements, the number of acceptable synonym replacements, or the number of correct form class replacements.

Studies investigating the effects of different cloze test forms and different scoring systems have been conducted by Bormuth.[1] The use of exact-length blanks in cloze tests of reading comprehension have been investigated by Anderson.[1] Various theoretical and practical aspects of the cloze procedure have been discussed by Culhane; Hafner; Ohnmacht, Weaver, and Kohler; Rankin; Taylor; Tuinman and Blanton; and Weaver.[2]

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[1] John R. Bormuth, "Experimental Applications of Cloze Tests," Improvement of Reading Through Classroom Practice, ed. by J. Allen Figurel, Proceedings of the International Reading Association (Newark, Delaware: International Reading Association, 1964), pp. 303-306; John R. Bormuth, "Validities of Grammatical and Semantic Classifi-

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cations by Cloze Test Scores," Reading and Inquiry, ed. by J. Allen Figurel, Proceedings of the International Reading Association (Newark, Delaware: International Reading Association, 1965), pp. 283-286.

[1] Jonathan Anderson, "A Report of Research on Comprehension in Reading" (paper presented at the Third International Reading Association World Congress on Reading, Sydney, Australia, August 7-9, 1970).

[2] Joseph W. Culhane, "Cloze Procedures and Comprehension," The Reading Teacher, 23 (1970), 410-413, 464; Lawrence E. Hafner, "Relationships of Various Measures to the 'Cloze'," New Concepts in College-Adult Reading, ed. by Eric L. Thurston and Lawrence E. Hafner, Thirteenth Yearbook of the National Reading Conference (Milwaukee, Wisconsin: National Reading Conference, 1963), pp. 135-145; Lawrence E. Hafner, "Implications of Cloze," The Philosophical and Sociological Bases of Reading, ed. by Eric L. Thurston and Lawrence E. Hafner, Fourteenth Yearbook of the National Reading Conference (Milwaukee, Wisconsin: National Reading Conference, 1965), pp. 151-158; Fred Ohnmacht, Wendell W. Weaver, and Emmett T. Kohler, "Cloze and Closure: A Factorial Study," The Journal of Psychology, 74 (1970), 205-217; Earl F. Rankin, Jr., "The Cloze Procedure - Its Validity and Utility," Starting and Improving College Reading Programs, ed. by Oscar S. Causey and William Eller, Eighth Yearbook of the National Reading Conference (Milwaukee, Wisconsin: National Reading Conference, 1959), pp. 131-144; Earl F. Rankin, Jr., "Closure and the Cloze Procedure," College and Adult Reading, ed. by David M. Wark, Conference Proceedings of the North Central Reading Association (Minnepolis, Minnesota: University of Minnesota, 1964), pp. 54-84; Earl F. Rankin, Jr., "Research Design and the Cloze Procedure," Vistas in Reading, ed. by J. Allen Figurel, Proceedings of the International Reading Association (Newark, Delaware: International Reading Association,

Since its introduction by Taylor in 1953 the cloze procedure has been applied with increasing frequency to studies concerned with readability, comprehension, language facility, and educational methodology. Subsequent chapters of this thesis present the literature pertinent to these four categories.

1966); Wilson L. Taylor, "Recent Developments in the Use of 'Cloze Procedure,'" Journalism Quarterly, 33 (1956), 42-48; Wilson L. Taylor, "Relative Influence of Preceding, Following, and Surrounding Contexts on Cloze Performance" (paper presented at the Annual Meeting of the National Reading Conference, Tampa, Florida, December 3, 1971); J. Jaap Tuinman and B. Elgit Blanton, The Cloze Procedure: Corollaries of a Search Hypothesis (Bloomington, Indiana: School of Education, University of Indiana, 1971); Wendell W. Weaver, "Theoretical Aspects of the Cloze Procedure," The Philosophical and Sociological Bases of Reading, ed. by Eric L. Thurston and Lawrence E. Hafner, Fourteenth Yearbook of the National Reading Conference (Milwaukee, Wisconsin: National Reading Conference, 1965), pp. 115-132.

ANDERSON, JONATHAN. A REPORT OF RESEARCH ON COMPREHENSION IN READING. PAPER PRESENTED AT THE THIRD INTERNATIONAL READING ASSOCIATION WORLD CONGRESS ON READING, SYDNEY, AUSTRALIA, AUGUST 7-9, 1970.

Purpose: The use of exact-length blanks in cloze tests of reading comprehension was investigated.

Principles, Concepts, or Procedures: Subjects were indigenous primary-school pupils in New Guinea for whom English was a foreign language.

Conclusions: No significant difference was found between the mean scores of subjects on cloze tests using blanks of a uniform length and the mean scores of subjects on cloze tests using blanks of the same length as the deleted words. Both versions of cloze tests were equally valid as measures of general reading comprehension. The question of length of blank to use in cloze tests has practical as well as theoretical significance for teachers in constructing cloze tests when they wish to use photocopying facilities. The implication of these findings is that by the use of a photocopy procedure, such factors as size of print, illustrative material, and page layout may be included in the estimate of the ease or difficulty of printed material as measured by cloze tests. Tables and references are included.[1]

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[1] Research in Education (Washington, D.C.: United States Government Printing Office, 1971), Vol. 6, No. 4, p. 111. (ED 045 323, 13 pages).

BORMUTH, JOHN R. "EXPERIMENTAL APPLICATIONS OF CLOZE TESTS." IMPROVEMENT OF READING THROUGH CLASSROOM PRACTICE. EDITED BY J. ALLEN FIGUREL. PROCEEDINGS OF THE INTERNATIONAL READING ASSOCIATION. NEWARK, DELAWARE: INTERNATIONAL READING ASSOCIATION, 1964, 303-306.

Purpose: The author states three purposes for the study.

1. to discover if the five forms of a cloze test made from the same passage differ in difficulty.

2. if they do, by how much.

3. to determine if these differences were influenced by the number of items included in the forms.

Principles, Concepts, or Procedures: Five cloze tests of 50 items each were made over each of 20 passages. Deletions were made so that every word in a 250 word section of every passage became a deletion item in one of the five forms. The passages ranged in Dale-Chall readability from approximately 4.0 to 8.0 and were chosen from textbooks and literary works. The 695 subjects were organized into five groups on the basis of Stanford Reading Achievement Test scores. A different form of the cloze test was assigned to each group. Only exact-word replacements were accepted.

Conclusions: The following conclusions were reached.

1. The means on different cloze test forms that are made from the same passage differ significantly for tests of 50 items or less. . . .
2. The differences in difficulty among test forms made from the same passage tend to diminish as more items are included in the test forms.
3. The practice of using only a single cloze test form over each of the passages that a researcher is studying should probably be avoided where precise determinations of passage difficulties are needed and especially when the passages are short. In such experiments all five forms should be used.

4. When single forms are used in experiments it is necessary to show that the observed differences are sufficiently large to assure that they did not arise solely because of the test forms. . . . (306)

BORMUTH, JOHN R. "VALIDITIES OF GRAMMATICAL AND SEMANTIC CLASSIFICATIONS OF CLOZE TEST SCORES." READING AND INQUIRY. EDITED BY J. ALLEN FIGUREL. PROCEEDINGS OF THE INTERNATIONAL READING ASSOCIATION. NEWARK, DELAWARE: INTERNATIONAL READING ASSOCIATION, 1965, 283-286.

Purpose:

> . . . cloze test responses are classified according to their semantic and grammatical relationships to the deleted word and scores based on each of these categories are studied to find out which are the most valid when the tests are used to measure reading ability and passage difficulty. (283)

Principles, Concepts, or Procedures: A 52-item cloze test was constructed over each of 20 passages. These were administered to 50 fifth and sixth grade subjects. Two tests per test period were given during a ten day period. There were no time limits. The Stanford Achievement Test: Reading was given prior to the cloze testing.

Conclusions:

> 1. When cloze tests are used as measures of individual differences in reading ability, scores obtained by counting responses exactly matching the deleted words seem to yield the most valid scores.
>
> 2. When cloze tests are used in readability studies as measures of the comprehension difficulties of passages, scores obtained by counting responses exactly matching the deleted words seem to yield the greatest amount of discrimination among passage difficulties. (285)

CULHANE, JOSEPH W. "CLOZE PROCEDURES AND COMPREHENSION." THE READING TEACHER, 23 (1970), 410-413, 464.

Purpose: The author discusses the history of the cloze procedure, as well as the construction, scoring, and uses of cloze materials.

Principles, Concepts, or Procedures: The studies made of the cloze procedure since 1953 have demonstrated its usefulness to the reading field particularly in the area of teaching and testing comprehension.

Once the deletion pattern has been decided, a researcher deletes words in every sentence of a passage, except the first and last sentence, and replaces each deleted word with a blank space. The blanks should be of uniform length in testing situations. However, in teaching situations, they may be as long as the deleted word and may even begin with the first letter of the deleted word. Exact word replacements should be required when the exercises are used as a test device. Synonyms should be accepted in teaching situations and discussion of answers should take place.

Cloze is a useful technique for use with word callers, for it forces attention to context as the passage is read and not afterwards. Cloze is also useful in promoting better language patterns.

Conclusions: The cloze technique is easily learned and put to use by both teachers and pupils. To complete deletions correctly, careful reading and the use of context are required.

HAFNER, LAWRENCE E. "RELATIONSHIPS OF VARIOUS MEASURES TO THE 'CLOZE'." NEW CONCEPTS IN COLLEGE-ADULT READING. EDITED BY ERIC L. THURSTON AND LAWRENCE E. HAFNER. THIRTEENTH YEARBOOK OF THE NATIONAL READING CONFERENCE. MILWAUKEE, WISCONSIN: NATIONAL READING CONFERENCE, 1963, 135-145.

Purpose: This researcher investigated the relationships of various measures (vocabulary, intelligence, information, achievement, personality, and reasoning) to pre-reading cloze.

Principles, Concepts, or Procedures: Subjects were thirty-two male and female senior college students enrolled in a reading methods course.

A 50-item cloze test using every-fifth-word deletions was developed from an article on educational television. Among other instruments used were: *Michigan Vocabulary Profile Test*; *Otis Quick-Scoring Mental Ability Test, Gamma*; *Cattell 16 Personality-Factor Questionnaire*; and *Wechsler-Bellevue Intelligence Scale*, Information sub-test.

Conclusions:

1. Cloze scores correlated positively and significantly with vocabulary, intelligence, information, achievement, and reasoning. They were not related to introversion.

2. Cloze scores compared favorably with standard predictors as a predictor of course grades.

HAFNER, LAWRENCE E. "IMPLICATIONS OF CLOZE." THE PHILOSOPHICAL AND SOCIOLOGICAL BASES OF READING. EDITED BY ERIC L. THURSTON AND LAWRENCE E. HAFNER. FOURTEENTH YEARBOOK OF THE NATIONAL READING CONFERENCE. MILWAUKEE, WISCONSIN: NATIONAL READING CONFERENCE, 1965, 151-158.

Purpose: The author discusses the implications of the cloze procedure.

Principles, Concepts, or Procedures: The author indicates that cloze tests are valid measures of comprehension but should not be used as replacements of informal inventories. Each can complement the other.

Cloze is useful for improving the writing of materials. To be intelligible, materials require an amount of redundancy as opposed to the terseness so often found in concept-laden material.

The author suggests that cloze can be modified to show the role of reasoning in reading and to discover the dynamics of the thinking process in individual students.

In addition to studies of readability, cloze has application to language creativity.

Cloze tests utilizing letter deletions as opposed to word deletions yielded high correlations with elementary reading tests.

Conclusions: A center for the collection and dissemination of cloze knowledge would be useful to education.

OHNMACHT, FRED; WEAVER, WENDELL W.; AND KOHLER, EMMETT T. "CLOZE AND CLOSURE: A FACTORIAL STUDY." THE JOURNAL OF PSYCHOLOGY, 74 (1970), 205-217.

Purpose: The authors explored

> . . . the relationship of flexibility of closure and speed of closure to a number of cloze tasks representing structural, lexical, concrete, and abstract deletions. (206)

Principles, Concepts, or Procedures: The Hidden Patterns Test and the Hidden Figures Test, and the Gestalt Completion Test and the Concealed Words Test were administered to determine flexibility and speed of closure respectively. Measures of associational fluency and verbal comprehension were determined from the Controlled Associations Test and the Association IV, and the Wide Range Vocabulary Test and the Advanced Vocabulary Test respectively.

The cloze tests were developed from materials previously graded for difficulty.[1] The structural cloze tests deleted every fifth word regardless of function. Lexical cloze tests were made by deleting every fifth noun, verb, or adjective. Abstract noun and concrete noun forms were developed from the rationale that abstract nouns describe "objects" not perceivable by the senses while concrete nouns describe words which are perceivable. Every-fifth-word deletions were also used in these two forms.

Subjects were 115 high school students who were administered the test battery over a two week period. The cloze test scoring required exact replacements.

Conclusions:

1. Structural and concrete cloze tasks yielded higher means than did lexical and abstract ones.

2. Some relationship exists between flexibility and speed of closure and cloze tasks. Flexibility, however, is more closely related to cloze tasks.

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[1] See G. R. Miller and E. B. Coleman, "A Set of Thirty-Six Prose Passages Calibrated for Complexity," p. 61 of this thesis.

RANKIN, EARL F., JR. "THE CLOZE PROCEDURE - ITS VALIDITY AND UTILITY." STARTING AND IMPROVING COLLEGE READING PROGRAMS. EDITED BY OSCAR S. CAUSEY AND WILLIAM ELLER. EIGHTH YEARBOOK OF THE NATIONAL READING CONFERENCE. MILWAUKEE, WISCONSIN: NATIONAL READING CONFERENCE, 1959, 131-144.

Purpose: The author

1. considers the validity of the cloze procedure as a measure of readability, intelligence, pre-reading knowledge, and aspects of reading comprehension.

2. offers suggestions concerning the use of the procedure.

Principles, Concepts, or Procedures: An explanation of the cloze procedure and a comparison with other techniques such as sentence completion tests are given initially.

As measures of readability, the traditional formulae are insensitive to short, abstract words and sentences, and to irregular grammatical characteristics of some sentences. Cloze is a more reliable measure of readability, for it deletes systematically words from sentence patterns so that the reader can replace them because of his ability to predict from the surrounding redundancy.

Cloze appears to be a measure of intelligence only when all word classes have an equal chance of being deleted. Deletions of nouns, verbs, and adjectives yield very low correlations because of the difficulty in replacing them when all words of those classes are missing from context.

As a measure of knowledge before reading, cloze is a valid predictor when a second test is used as a criterion measure. Deletions of nouns, verbs, and adjectives are most highly discriminating here.

Recent research indicates high correlations between cloze scores and general reading comprehension. Lexical comprehension can also be measured by cloze when high meaning units such as nouns and verbs are deleted. High correlations have been reported between cloze scores and immediate recall. Cloze is presumably a valid measure of post-reading comprehension.

The usefulness of cloze tests can readily be seen when the time required for writing objective questions is considered. Equivalent forms can be made from the same materials. However there is some evidence that subjects with above average anxiety perform poorly on cloze tests.

The classroom teacher will find cloze useful in determining the readability of textbook material, as a measure of general comprehension, and as a diagnostic tool where discussion of replaced words occurs.

Conclusions: Many aspects of the cloze procedure require investigation to fully realize its potentialities.

RANKIN, EARL F. "CLOSURE AND THE CLOZE PROCEDURE." COLLEGE AND ADULT READING. EDITED BY DAVID M. WARK. CONFERENCE PROCEEDINGS OF THE NORTH CENTRAL READING ASSOCIATION. MINNEAPOLIS, MINNESOTA: UNIVERSITY OF MINNESOTA, 1964, 54-84.

Purpose: The author reviews selected studies on closure relevant to the cloze procedure.

Principles, Concepts, or Procedures: Rankin begins by defining the cloze procedure and tracing its rationale from Gestalt psychology.

The nature of closure is next considered. The role of previous experience and the implications of neurological theory are discussed. The research studies of Street, Thurstone, Rimaldi, Bechtoldt, Pemberton, and Mooney are discussed relative to speed and flexibility of closure. The relationship of closure to cognition, personality, reading, and age and sex differences are considered with reference made to research.

Rankin believes ". . . the cloze procedure probably involves cognitive more than visual closure." (74) Auditory-motor closure may, in some instances, be involved. These three behavioral levels are not necessarily related.

Personality factors such as rigidity and impulsivity, social context, particularly anxiety, and age differences are cited as important considerations relative to closure, cloze, and the total reading process.

Conclusions: Rankin hopes a degree of closure will result within individuals reading this paper.

A bibliography of sixty-seven references is included.

RANKIN, EARL F., JR. "RESEARCH DESIGN AND THE CLOZE PROCEDURE." VISTAS IN READING. EDITED BY J. ALLEN FIGUREL. PROCEEDINGS OF THE INTERNATIONAL READING ASSOCIATION. NEWARK, DELAWARE: INTERNATIONAL READING ASSOCIATION, 1966, 489-491.

Purpose: The author discusses two approaches to improving research design in studies utilizing the cloze procedure.

Principles, Concepts, or Procedures: Rankin contends that comprehension is usually measured as an "after reading" product. Since individuals approach reading tasks with some previous knowledge it is desirable to know what information was gained from the passage alone. The cloze procedure is an effective device for measuring residual gain.

Because the skills required for success in the cloze procedure are teachable, cloze has many possibilities as a teaching device.

Conclusions: The cloze procedure is a powerful research tool with many possibilities yet to be realized.

TAYLOR, WILSON L. "RECENT DEVELOPMENTS IN THE USE OF 'CLOZE PROCEDURE.'" JOURNALISM QUARTERLY, 33 (1956), 42-48.

Purpose: The author reports results from recent studies he conducted to investigate the appropriateness of cloze as a measure of comprehension in both English and Korean, of listenability news broadcasts, and of intelligence, existing knowledge, and learning.

Principles, Concepts, or Procedures: Subjects in the Sampson Air Base study were administered two comprehension tests, two cloze tests, and an intelligence test to determine "before" and "after" learning as well as intelligence.

Easy, medium, and hard passages in the Korean language were adapted to cloze and administered to Korean college students.

A "good" and a "bad" script both utilizing cloze, were prepared for two stories which were read by an experienced announcer to determine listenability.

Conclusions:

1. Cloze is a reliable measure of comprehension, and, hence, readability.
2. Learning and intelligence also seem to be measured.
3. Cloze is a discriminator between the listenabilities of two oral presentations.

Among other conclusions were:

1. "There seems to be little advantage in preclassifying words and limiting deletions to them. . . ." (48)
2. There was no advantage to scoring synonyms.
3. Every fifth-word deletion located blanks as far apart as they needed to be.
4. A series of about 50 deletions was sufficient to yield a stable score of the difficulty of a given passage.

TAYLOR, WILSON L. "RELATIVE INFLUENCE OF PRECEDING, FOLLOWING, AND SURROUNDING CONTEXTS ON CLOZE PERFORMANCE." PAPER PRESENTED AT THE ANNUAL MEETING OF THE NATIONAL READING CONFERENCE, TAMPA, FLORIDA, DECEMBER 3, 1971.

Purpose: The influences of "preceding," "following," and "surrounding" contexts on cloze responses were investigated.

Principles, Concepts, or Procedures: Forty-five prose fragments were drawn from a short story, "The Egg," by Sherwood Anderson. Each fragment consisted of eleven words. The middle word in each fragment--the sixth--was deleted. Three forms for each fragment were prepared; one presented both the five "preceding" and "following" contexts while the remaining two presented either the "preceding" or "following" contexts.

The resulting 135 fragments were organized into three assemblies of forty-five fragments each so that fifteen of each of the three versions of context appeared.

Subjects were nineteen college students. Each response was scored as like or unlike the original word and the responses of other subjects.

Conclusions:

1. "Preceding" and "following" contexts were found to be about equal in their influences on cloze responses.

2. Taylor notes the limitations of the study and suggests replication incorporating other subjects and materials.

TUINMAN, J. JAAP, AND BLANTON, B. ELGIT. THE CLOZE PROCEDURE: COROLLARIES OF A SEARCH HYPOTHESIS. BLOOMINGTON, INDIANA: SCHOOL OF EDUCATION, UNIVERSITY OF INDIANA, 1971.

Purpose: In order to determine whether the kind of process underlying cloze responses is indeed a systematic and exhaustive search, a study was conducted exploring some corollaries to such a search hypothesis.

Principles, Concepts, or Procedures: It was assumed that subjects would generate responses representing a number of word types, that some of these word types would be sensible and some nonsensical, and that responses would be representative of the entire body of possible response words. Five versions of a 300-word cloze passage, every fifth word deleted, were administered to 390 junior-high-school students who were randomly assigned to one of the versions. Protocols were hand scored and success probabilities were calculated. A correlation matrix among seven variables was calculated and analyzed using a stepwise regression program.

Conclusions: Significant correlations were noted among the seven variables, with the highest correlation appearing between size of response body related to success probability. It was concluded that the general search hypothesis appeared to be sustained since distribution of responses was related to success probability and since the ratio of nonsense to sensible responses was relevant to that distribution. It was implied that a search process could be characterized as systematic in part. Tables and references are included.[1]

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[1] Research in Education (Washington, D.C.: United States Government Printing Office, 1971), Vol. 6, No. 6, pp. 104-105. (ED 047 913, 13 pages).

WEAVER, WENDELL W. "THEORETICAL ASPECTS OF THE CLOZE PROCEDURE." THE PHILOSOPHICAL AND SOCIOLOGICAL BASES OF READING. EDITED BY ERIC L. THURSTON AND LAWRENCE E. HAFNER. FOURTEENTH YEARBOOK OF THE NATIONAL READING CONFERENCE. MILWAUKEE, WISCONSIN: NATIONAL READING CONFERENCE, 1965, 115-132.

Purpose: The author discusses various theoretical aspects of the cloze procedure, particularly that of language and thought.

Principles, Concepts, or Procedures: Weaver questions whether the rationale for the cloze procedure is, in fact, Gestaltist in nature. Since there is no evidence that cloze units are completed in a perceptual fashion, he prefers to view the procedure as a coding operation.

Language and thought are complexly bound together and form an important attribute of the cloze procedure. One means of studying cloze in this situation is by making structural and lexical deletions. To these deletions, syntactic and semantic constraints are closely related.

Structural cloze scores are better predictors of readability probably because they are dealing with the absence rather than the presence of redundancy. The cloze procedure is essentially a searching procedure which again emphasizes the importance of language and thought.

Conclusions: Diverse areas of education and the social sciences have made use of the cloze procedure. An area requiring study is that of syntactic and semantic effects of context on particular language units.

CHAPTER II

THE CLOZE PROCEDURE AS A MEASURE OF READABILITY

The initial research related to the cloze procedure as a measure of readability was undertaken by Taylor[1] who found that prose passages written by Stein, Caldwell, and Joyce were assessed more accurately by the cloze procedure than by the Dale-Chall and Flesch formulae. Moreover, Taylor found that selected passages were ranked in exactly the same order of difficulty by these three methods.

Bormuth[2] also investigated the validity of assessing readability by means of cloze tests. The influences of sample size and number of items on the precision of cloze tests used for readability purposes were also investigated by Bormuth.[3] Later, Bormuth[4] isolated factors of importance in the development of readability formulae.

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[1] Wilson L. Taylor, "'Cloze Procedure': A New Tool for Measuring Readability," Journalism Quarterly, 30 (1953), 414-438.

[2] John Robert Bormuth, "Cloze Tests as Measures of Readability and Comprehension Ability" (unpublished Ed.D. dissertation, Indiana University, 1962).

[3] Bormuth, "Optimum Sample Size and Cloze Test Length in Readability Measurement," Journal of Educational Measurement, 2 (1965), 111-116.

[4] Bormuth, "Readability: A New Approach," Reading Research Quarterly, 1 (1966), 79-131; John R. Bormouth,

Bormuth and MacDonald[1] tested the hypothesis that cloze test scores are positively correlated with the ability to detect an author's style.

Specific instructional materials designed for use by students have been assessed for readability by means of the cloze procedure. Gallant[2] estimated the readability of primary grade reading materials. Covington[3] assessed the readability of third, and fourth grade modern mathematics textbooks, while Kulm[4] estimated the readability of elementary algebra textbooks.

"New Data on Readability," Forging Ahead in Reading, ed. by J. Allen Figurel, Proceedings of the International Reading Association (Newark, Delaware: International Reading Association, 1967), pp. 488-492; Cloze Readability Procedure, (Los Angeles: Center for the Study of Evaluation of Instructional Programs, University of California, 1967).

[1] John R. Bormuth and O. L. MacDonald, "Cloze Tests as a Measure of Ability to Detect Literary Style," Reading and Inquiry, ed. by J. Allen Figurel, Proceedings of the International Reading Association (Newark, Delaware: International Reading Association, 1965), pp. 287-290.

[2] Ruth Margaret Frances Gallant, "An Investigation of the Use of Cloze Tests as a Measure of Readability of Materials for the Primary Grades" (unpublished Ed.D. dissertation, Indiana University, 1964).

[3] Richard John Lee Covington, "An Analysis of Readability of Third and Fourth Grade Modern Mathematics Textbooks Using the Cloze Procedure" (unpublished Ed.D. dissertation, University of California, Los Angeles, 1966).

[4] Gerald Kulm, "Measuring the Readability of Elementary Algebra Using the Cloze Technique" (paper presented at the Annual Meeting of the American Educational Research Association, New York, N. Y., February 4-7, 1971).

The readability of encyclopedia content designed for elementary school pupils has been assessed by Liske.[1] Froese[2] compared Dale-Chall readability ratings of sixth grade science textbooks with cloze results. The readability of certain high school textbooks was determined by Beard.[3] The cloze procedure was utilized by Froelich[4] in measuring the readability of selected college level electronics textbooks, and by Houska[5] in estimating the readability of industrial education content material at the high school level.

The development of other readability scales has been facilitated by the cloze procedure. Miller and Coleman[1] utilized three different cloze techniques to develop a set of prose passages ranging in difficulty from first grade reading material to technical material. The resulting Miller-Coleman Readability Scale has been validated by Aquino.[2]

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[1] Wilfred Wallace Liske, "The Cloze Procedure for Determining Readability of Encyclopedia Material for Elementary School Pupils" (unpublished Ed.D. dissertation, University of Maryland, 1968).

[2] Victor Froese, "Cloze Readability Versus the Dale-Chall Formula" (paper presented at the Annual Meeting of the International Reading Association, Atlantic City, New Jersey, April 19-23, 1971).

[3] Jacob G. Beard, "Comprehensibility of High School Textbooks: Association With Content Area," Journal of Reading, 11 (1967), 229-234.

[4] Donald Max Froelich, "A Comparison of Two Methods of Assessing Textbook Readability of Selected College Level Electronics Textbooks" (unpublished Ed.D. dissertation, University of Missouri - Columbia, 1970).

[5] Joseph Thomas Houska, "The Efficacy of the Cloze Procedure as a Readability Tool on Technical Content Material as Used in Industrial Education at the High School Level" (unpublished Ed.D. dissertation, University of Illinois at Urbana-Champaign, 1971).

Fry[3] utilized the cloze procedure as one of three criterion measures in assessing the validity of the Fry Readability Graph. Noun frequency counts in combination with the cloze procedure have been used by Elley[4] to measure readability.

With respect to readability, studies have focused on the difficulties within prose selections. Taylor[5] and MacGinitie[1] investigated the effects of contextual constraint in English prose paragraphs on readability and comprehension, while Aborn, Rubenstein, and Sterling[2] and Blake[3] investigated contextual constraint upon words within sentences.

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[1] G. R. Miller and E. B. Coleman, "A Set of Thirty-six Prose Passages Calibrated for Complexity," Journal of Verbal Learning and Verbal Behavior, 6 (1967), 851-854.

[2] Milagros Aquino, "The Validity of the Miller-Coleman Readability Scale," Reading Research Quarterly, 4 (1969), 342-357.

[3] Edward B. Fry, The Readability Graph Validated at Primary Levels (Cambridge, Massachusetts: Computer Assisted Instruction Laboratory, Graduate School of Education, Harvard University, 1969).

[4] Warwick B. Elley, "The Assessment of Readability by Noun Frequency Counts," Reading Research Quarterly, 4 (1969), 411-427.

[5] Wilson L. Taylor, "Application of 'Cloze' and Entropy Measures to the Study of Contextual Constraint in Samples of Continuous Prose," (unpublished Ph.D. dissertation, University of Illinois, 1954).

Jefferson[4] analyzed lexical and structural cloze deletions as measures of readability. Rentel[5] assessed the effects of combining a word classification system with word length to measure the difficulty of certain word categories.

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[1] Walter Harold MacGinitie, "Contextual Constraint in English Prose" (unpublished Ph.D. dissertation, Columbia University, 1960).

[2] Murray Aborn, Herbert Rubenstein, and Theodor D. Sterling, "Sources of Contextual Constraint Upon Words in Sentences," Journal of Experimental Psychology, 57 (1959), 171-180.

[3] James Herbert Blake, "Cloze Scores, Agreement Scores, and Approximated Equivalence Scores as Indices of Contextual Constraint" (unpublished Ph.D. dissertation, Syracuse University, 1970).

[4] George Lee Jefferson, Jr., "Lexical and Structural Items as Predictors of Readability for High and Low Ability Readers" (unpublished Ph.D. dissertation, University of Georgia, 1969).

[5] Victor Michael Rentel, "Form Class and Word Length as Indices of the Difficulty of Predicting Cloze Entries in a Sample of Continuous Prose" (unpublished Ph.D. dissertation, University of South Carolina, 1969).

ABORN, MURRAY; RUBENSTEIN, HERBERT; AND STERLING, THEODOR D. "SOURCES OF CONTEXTUAL CONSTRAINT UPON WORDS IN SENTENCES." JOURNAL OF EXPERIMENTAL PSYCHOLOGY, 57 (1959), 171-180.

Purpose: "This study investigated the constraint upon words attributable to the length, distribution, and structure of context consisting of incomplete sentences." (171)

Principles, Concepts, or Procedures: From about 3000 sentences drawn at random from a number of popular magazines, 1380 were selected.

> One word was omitted from each sentence in a way that yielded three treatments of sentence length, within which were four treatments of position of omission, within which were six treatments of word class of the omitted word. (179)

Subjects were 24 second-semester freshmen enrolled at the University of Alabama. There were twenty 90 minute sessions lasting four weeks. Only exact-word replacements were accepted.

Conclusions: Among the conclusions were:

1. The length, distribution, and grammatical structure of context are all independently effective sources of constraint on words in sentences.
2. The predictability of words belonging to a given word class is, in general, inversely related to the size of that class. . . .
3. Increasing the context beyond 10 words does not increase predictability. The length at which context attains maximum effectiveness lies between 5 and 10 words.
4. A bilaterally distributed context exerts greater constraint than a totally preceding or totally following context of the same length. . . . (179)

AQUINO, MILAGROS. "THE VALIDITY OF THE MILLER-COLEMAN READABILITY SCALE." READING RESEARCH QUARTERLY, 4 (1969), 342-357.[1]

Purpose: The author reports an investigation to validate the Miller-Coleman passages calibrated for complexity, otherwise known as the Miller-Coleman Readability Scale.

Principles, Concepts, or Procedures: Fourteen adult subjects read six passages for six consecutive working days. One minute was allowed for each passage to be read. Subjects were then required to recall the passage orally or in writing. Correct noun, verb, adjective, and adverb replacements were scored.

At the conclusion of this phase of the study, subjects were required to place the 36 passage cards in five stacks according to difficulty. Subjects then ranked each stack of cards for relative difficulty.

Conclusions: Word-for-word recall and judged difficulty correlated highly with both the bilateral and unilateral cloze aspects of the scale.

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[1] See also G. R. Miller, and E. B. Coleman "A Set of Thirty-Six Passages Calibrated for Comprehensibility," p. 61 of this thesis.

BEARD, JACOB G. "COMPREHENSIBILITY OF HIGH SCHOOL TEXTBOOKS: ASSOCIATION WITH CONTENT AREA." JOURNAL OF READING, 11 (1967), 229-234.

Purpose: The author investigated ". . . differences in comprehensibility of textbooks associated with school subject matter content areas." (229)

Principles, Concepts, or Procedures: Ten passages of 250 words each were randomly selected from each of four areas: biology, chemistry, American government, and world history.

Subjects were 250 tenth grade students in Tampa, Florida who were sampled from five ability levels according to verbal scores received on the School and College Ability Test.

Five forms of a cloze test were prepared for each passage. Since every fifth-word deletions were used, every word was a restorable item in each form. Only exact replacements were scored correct.

Comprehensibility was also measured by using the average number of words per T-unit. Each passage was also

> . . . analyzed to determine the extent of use of 10 elements of expressional style: monosyllable words, sentence length, first person pronouns, second person pronouns, third person pronouns, different words, complex sentences, infinitive phrases, words beginning with the letter "i," and abstract nouns. (233-234)

Conclusions: "Small and insignificant differences were found for the means of the comprehensibility measures . . ." (234) and for all the structural variables except "i" words and infinitive phrases.

> It was concluded that the comprehensibility of prose used in current high school textbooks is, on the average, about the same for American government, world history, biology, and chemistry. (234)

BLAKE, JAMES HERBERT. "CLOZE SCORES, AGREEMENT SCORES, AND APPROXIMATED EQUIVALENCE SCORES AS INDICES OF CONTEXTUAL CONSTRAINT." UNPUBLISHED PH.D. DISSERTATION, SYRACUSE UNIVERSITY, 1970.

Purpose: Problems in indexing a language variable, contextual constraint, were considered in this study. The contextual constraint of a position in connected discourse is the degree to which the words elsewhere in the discourse determine what word occupies the position.

Principles, Concepts, or Procedures: Three indices were considered: the cloze score, the agreement score, and the approximated equivalence score. These are scores that can be calculated from data obtained by means of a deletion-test item.

The cloze score is computed according to the following formula:

Cloze score = P_1

in which P_1 is the relative frequency of the response identical to the deleted word.

The agreement score is the ratio of the amount of agreement among the responses to a deletion-test item and the greatest amount of agreement possible. As a computational procedure, the agreement score is identical to the Shannon redundancy index. . . .

. . . .

The subjects were undergraduate history students who participated in two testing sessions. During the first session they responded to a variety of deletion-test items. During the second session they responded to a variety of free-association-test items. The stimuli for these latter items were words that the subjects had offered frequently in response to the deletion-test items.

Conclusions: The cloze score and the agreement score were compared with respect to detecting known differences in contextual constraint. Approximations to English were the sources of these known differences in contextual constraint. The agreement score was found to be more sensitive than the cloze score to these differences.

The cloze score and the agreement score were each used in attempts to detect differences in the contextual constraints within twenty-five-word sentences and the contextual constraints within eleven-word sentences. Regardless of the index used, no differences were detected. It could not be determined whether there were in fact no differences or whether both indices were too insensitive to detect whatever differences were present.

The cloze score and the approximated equivalence score were compared with respect to estimating contextual constraint. Estimates were higher by small amounts when approximated equivalence scores indexed contextual constraint than when cloze scores estimated contextual constraint. Even when contextual constraints were known to be very small, approximated equivalence scores provided higher estimates than cloze scores.

The cloze score and the approximated equivalence score were each used to estimate the contextual constraints upon selected positions in an experimental passage. Scores exceeded a 0.100 criterion for a greater number of positions when approximated equivalence scores indexed contextual constraint than when cloze scores indexed contextual constraint. Thus, a greater number of positions were judged to be under substantial contextual constraint when approximated equivalence scores were used.

It was concluded that when researchers must detect differences in contextual constraint, the cloze score is not the most appropriate index. In such situations, the researcher should use an index more sensitive to differences in contextual constraint. The agreement score apparently is more sensitive than the cloze score. In the future, however, other indices may prove even more sensitive than the agreement score.

In addition, it was concluded that when researchers must detect even small amounts of contextual constraint, the cloze score is not the most appropriate index. The approximated equivalence score is more appropriate because it is less likely to underestimate contextual constraint. In the future other indices may prove to be even more appropriate than the approximated equivalence score in such situations.

Future research projects might involve a search for more easily computed indices that have the desirable properties of agreement scores and approximated equivalence scores. In addition, future projects might use cloze scores, agreement scores, and approximated equivalence scores to predict the incidence of substitution-type word recognition errors. Predictions about the words substituted and predictions about the effects of each substitution on comprehension might be made. Such predictions could be compared with actual reading performances.[1]

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[1] Dissertation Abstracts International A: The Humanities and Social Sciences (Ann Arbor, Michigan: University Microfilms, 1971), Vol. 31, No. 11, pp. 5923-A, 5924-A. (Order No. 71-10,892, 331 pages).

BORMUTH, JOHN ROBERT. "CLOZE TESTS AS MEASURES OF READABILITY AND COMPREHENSION ABILITY." UNPUBLISHED ED.D. DISSERTATION, INDIANA UNIVERSITY, 1962.[1]

Purpose: The purpose of this study was to investigate the validity of cloze tests as measures of the readability of the passages from which they are made. Since the readability of a passage is defined by the amount of comprehension with which it is read, it was necessary to investigate three aspects of cloze tests. These were (1) their validities as measures of comprehension ability, (2) their efficiencies when used for the purposes of discriminating among the difficulties of tests and the abilities of individuals, and (3) their validities as measures of the amounts of comprehension with which passages are read.

Principles, Concepts, or Procedures: Nine passages were used. These were equally divided among three classes of subject matters and three levels of difficulty. A 31 item comprehension test was written over each passage. Each test contained items measuring each of seven comprehension skills. By counting a subject's correct responses to the items measuring one skill in the entire set of tests, a measure of ability in that skill was obtained. Cloze tests were made over each passage by replacing every fifth word with a blank until 50 items were obtained. Only when a subject could write in the blank the exact word deleted was his response scored correct. All tests were administered to three groups of 50 subjects each. A group was composed of children enrolled at one grade level. The grade levels of the groups were grades 4, 5, and 6.

Conclusions: The findings supported the hypothesis that cloze tests are valid measures of comprehension ability. Scores on each of the nine cloze tests correlated with the scores on each of the seven tests of comprehension skills. Analysis of the variance of cloze scores showed that they were affected by the variables which affect comprehension scores. A similar analysis was applied to the scores of comprehension tests. The proportion of the variances due to each variable was found to be similar on the cloze and comprehension tests. All correlations between cloze and comprehension scores on tests over the same passages were significant. The correlations between the totals of the comprehension and cloze scores reached .946.

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[1] See also John R. Bormuth, "Cloze as a Measure of Readability," Appendix.

The findings supported the hypothesis that cloze tests are efficient when used for the purposes of measuring readability and comprehension ability. The difficulty values of the items on each test were distributed over the entire range of difficulties. The items had high correlations with the total scores on the tests which indicated that they tended to be intercorrelated. When test reliabilities were estimated by the method of rational equivalence, the median reliability was .837. When reliability was estimated from correlations among tests over passages in the same class of subject matter, the medial reliability was .802.

The findings supported the hypothesis that cloze tests measured the readability of the passages in this study. The difficulty rankings of the cloze tests were correlated with the difficulty rankings of the comprehension tests over the same passages. All correlations were significant. The comprehension test rankings were less reliable than the cloze test rankings. When the difficulty rankings of the comprehension tests were taken from the scores of the total group, their correlations with the cloze test rankings by each group ranged from .883 to .929.[1]

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[1] Dissertation Abstracts (Ann Arbor, Michigan: University Microfilms, 1963), Vol. 23, No. 11, pp. 4218-4219. (Order No. 63-2586, 205 pages).

BORMUTH, JOHN R. "OPTIMUM SAMPLE SIZE AND CLOZE TEST LENGTH IN READABILITY MEASUREMENT." JOURNAL OF EDUCATIONAL MEASUREMENT, 2 (1965), 111-116.

Purpose: The purpose of the study was ". . . to estimate the number of subjects and number of items required to attain various levels of precision in readability experiments involving cloze tests." (111)

Principles, Concepts, or Procedures: The procedure reported here is the same as that reported in "Experimental Applications of Cloze Tests."[1]

Conclusions: "Decisions of optimum research design must take into account theoretical, statistical, and economic factors." (115) The table of average standard errors developed as an adjunct to the experiment ". . . shows that error is reduced more by adding a given number of items than by adding the same number of subjects." (115)

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[1] See page 8 of this thesis.

BORMUTH, JOHN R. "READABILITY: A NEW APPROACH." READING RESEARCH QUARTERLY, 1 (1966), 79-131.

Purpose: "Five problems basic to the development of precise readability formulae were investigated." (79)

Principles, Concepts, or Procedures: The procedure reported here is the same as that reported in "Experimental Applications of Cloze Tests."[1]

Conclusions:

1. Nonlinear correlation techniques are required in some readability formulae.

2. Readability formulae can predict difficulty for the students at all levels of ability.

3. Difficulties inherent in words, independent clauses, and sentences can be predicted by readability formulae.

4. The high correlation between linguistic variables and passage difficulty (.934) indicates that the validity of formulae based on linquistic variables can be improved.

5. The development of more sophisticated linguistic variables will yield the greatest improvement in readability prediction.

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[1] See page 8 of this thesis.

BORMUTH, JOHN R. "NEW DATA ON READABILITY." FORGING AHEAD IN READING. EDITED BY J. ALLEN FIGUREL. PROCEEDINGS OF THE INTERNATIONAL READING ASSOCIATION. NEWARK, DELAWARE: INTERNATIONAL READING ASSOCIATION, 1967, 488-492.

Purpose: The author describes recent research in readability.

Principles, Concepts, or Procedures:

1. Measuring the difficulty of reading materials is considered first. Traditionally multiple choice tests have been used for this purpose. Because one can never be sure that he is not just measuring the difficulty of the test questions and because word, phrase, and sentence difficulties within the passage are thereby overlooked, multiple choice tests are not satisfactory measures. The cloze procedure, however, provides a valuable alternative, for the aforementioned difficulties are not existent therein.

2. The measurement and description of language is next discussed. "Present investigators are probing more deeply into the question of what makes a word difficult to understand." (489) Both word length and morphological complexity have been shown not to be sources of difficulty. The frequency with which a word is used may be of significance. "The degree of intricacy of the grammatical relationships between the parts of a sentence . . ." is ". . . an important source of difficulty in understanding the sentence." (490) Syntactic depth, modifier distance, and transformational complexity are highly related to sentence difficulty. "Modern researchers are looking beyond the word and the sentence to find the features of language that operate over longer segments of text to influence comprehension." (491)

3. The progressive development of readability formulae is outlined. An important finding has been that ". . . regardless of a person's reading ability, the same features of language that caused difficulty for him caused the same amount of difficulty for others." (491) Future research must examine transformations of words and also yield profiles of difficulty for each of the language features in a passage.

Conclusions: Because psychologists and linguists have developed new tools and because of increased understanding of mathematics, rapid strides have been and will continue to be made in readability research.

BORMUTH, JOHN R. CLOZE READABILITY PROCEDURE. LOS ANGELES: CENTER FOR THE STUDY OF EVALUATION OF INSTRUCTIONAL PROGRAMS, UNIVERSITY OF CALIFORNIA, 1967.[1]

Purpose: The research related to the cloze procedure as a measure of comprehension difficulty of written materials was reviewed.

Principles, Concepts, or Procedures: The characteristics, the validity, and the application of the cloze procedure are discussed. Among the topics are the following:

1. Measurement of past-reading knowledge.
2. Measurement of knowledge gain.
3. Measurement of passage difficulty.
4. Cloze test reliability.
5. Designing the testing procedure.
6. Deletion and scoring procedures.
7. Test administration.
8. Interpretation of scores.

Conclusions: The cloze procedure yields results which are more valid than those available from readability formulae. The procedure is applicable to a wide range of evaluation tasks.

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[1] See also John R. Bormuth, "The Implications and Uses of the Cloze Procedure in the Evaluation of Instructional Programs," Appendix.

BORMUTH, JOHN R., AND MACDONALD, O. L. "CLOZE TESTS AS A MEASURE OF ABILITY TO DETECT LITERARY STYLE." READING AND INQUIRY. EDITED BY J. ALLEN FIGUREL. PROCEEDINGS OF THE INTERNATIONAL READING ASSOCIATION. NEWARK, DELAWARE: INTERNATIONAL READING ASSOCIATION, 1965, 287-290.

Purpose: Two hypotheses were tested.

> 1. . . . there is a positive correlation between subjects' scores on cloze tests, and their scores on tests of ability to detect an author's style.
>
> 2. . . . scores on the test of ability to detect the author's style . . . have a higher correlation with the scores on the cloze test given after the subjects . . . read the book than with the scores on the test given to the subjects before they . . . read the book. (289)

Principles, Concepts, or Procedures: Tests designed to measure the literary styles of Trollope and Steinbeck were constructed. Chosen were 100 sample passages of about 40 words each, all of which represented Trollope's work. An additional 100 samples were drawn from the works of other authors. The 200 passages were typed on cards which were later shuffled. The subjects were 150 female college students who were required to read each passage and indicate which were written by Trollope. The same procedure was used with Steinbeck's writings.

The subjects were given a cloze test of 100 items made over Barchester Towers by Trollope before being assigned the book to read over a four week period. The author, his style, and the period were discussed in class. A second cloze test was given at the end of this period. The same procedure was used with respect to Of Mice and Men by Steinbeck.

Conclusions: The first hypothesis was significant at the .01 level and accepted, while the second hypothesis was not confirmed. It may be confidently assumed that a reader's sensitivity to style is an important variable in determining how well the reader will perform on a cloze test. Further, subjects who have not read the materials from which cloze tests were made seem to do as well as those who have studied the materials. This latter finding seemingly contradicts earlier studies by Rankin, and Weaver and Kingston.

COVINGTON, RICHARD JOHN LEE. "AN ANALYSIS OF READABILITY OF THIRD AND FOURTH GRADE MODERN MATHEMATICS TEXTBOOKS USING THE CLOZE PROCEDURE." UNPUBLISHED ED.D. DISSERTATION, UNIVERSITY OF CALIFORNIA, LOS ANGELES, 1966.

Purpose: The purpose of this study has been to employ the cloze procedure of test construction and evaluation in assessing the readability of two separate modern mathematics textbooks, one a third grade textbook and the other a fourth grade textbook, both published by Science Research Associates.

Principles, Concepts, or Procedures: Six 250-word passages were taken from each textbook and words deleted on an every fifth word basis. In addition, three deletion patterns were used in which Form A of each test deleted words starting with word one, Form B with word three, and Form C with word five, making 50 deletions. A standard length blank was used for each deletion.

The textbook passages were divided among three test types: word problems, statements of directions which tell pupils to perform some behavior in arithmetic activities, and statements of instructions which present presumably new mathematical concepts.

Pupils were divided into three ability groups. The first group included pupils on the California Test of Mental Maturity publisher's standardized stanines 1, 2, and 3. The second group from stanines 4, 5, and 6; and the third ability group from stanines 7, 8, and 9. Group two indicates pupils of average ability and group three above average. Group one, because of extremely small N's, was dropped from statistical analysis.

Conclusions: Assessment of readability was based on two measurements. The first was a count of those pupils' tests scoring 17 or more correct or 16 or less correct on each form and in each ability group. The other measure was the mean correct responses for each form, each test, and by ability group.

On the basis of the assumptions for the study, third grade second ability group pupils did not meet criterion scores on any tests. Third grade third ability group and all fourth grade pupils met or exceeded criterion scores only on word problems.

Therefore, by inference, the third and fourth grade Greater Cleveland Mathematics Program textbooks are not readable for third and fourth grade pupils, except for word problems.[1]

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[1] Dissertation Abstracts A: The Humanities and Social Sciences (Ann Arbor, Michigan: University Microfilms, 1967), Vol. 27, No. 10. (Order No. 67-4509, 108 pages).

ELLEY, WARWICK B. "THE ASSESSMENT OF READABILITY BY NOUN FREQUENCY COUNTS." READING RESEARCH QUARTERLY, 4 (1969), 411-427.

Purpose: The author describes the assessment of readability using noun frequency counts.

Principles, Concepts, or Procedures: Ten passages of approximately 150 words were devised. Every sixth word was deleted. Subjects were seventy secondary school pupils. Replacements of verbs, pronouns, adjectives, adverbs, conjunctions, and prepositions were superior in percentage scores to noun replacements.

These results and similar findings by other researchers prompted the author to consult teachers' and pupils' ratings as criterion measures. Noun frequency levels were consistently better predictors of difficulty.

Conclusions: The author recommends further investigation of the use of cloze scores as criterion measures.

FROELICH, DONALD MAX. "A COMPARISON OF TWO METHODS OF ASSESSING TEXTBOOK READABILITY OF SELECTED COLLEGE LEVEL ELECTRONICS TEXTBOOKS." UNPUBLISHED ED.D. DISSERTATION, UNIVERSITY OF MISSOURI - COLUMBIA, 1970.

Purpose: The purpose of this study was to compare the cloze readability technique with the Flesch Reading Ease Formula to ascertain the effectiveness of each in assessing the readability of selected college level electronics textbooks. The comparison was made in terms of student achievement on a multiple choice test over a passage selected from a college level electronics textbook.

Principles, Concepts, or Procedures: The study was conducted in three state colleges in Missouri and involved students enrolled in a basic electronics course in the Department of Industrial Education in each school.

The Flesch Reading Ease Formula was chosen for comparison with the cloze procedure in this study because of its general acceptance by textbook publishers and others as a convenient readability assessment technique.

Pearson product-moment correlations were computed to show the relationship between the cloze tests and the achievement test. T-tests of the difference between two means for correlated samples and for independent samples were computed to analyze the difference of the measures at both levels of readability.

A criterion cloze test score was employed to assess the written material as acceptable or not acceptable in comparison with reading abilities of the students.

Conclusions: Cloze test scores identified the readability levels of written technical material in a manner more consistent with the abilities of college students to comprehend the material as assessed by scores on an achievement test over the written technical material than the readability level assessment made by application of the Flesch Reading Ease Formula.

An analysis of the mean cloze test scores and of the mean achievement test scores revealed that although the Flesch Reading Ease Formula rated the technical material at the ninth and at the fifteenth grade levels of readability, the ability of the students to comprehend the written material, as assessed by the results of the achievement test, was not predicted by the readability levels as assessed by the Flesch Reading Ease Formula.

The Flesch Reading Ease Formula did not identify the readability of written technical material in a manner that was consistent with the ability of the college student to comprehend the material as assessed by an achievement test over the same material.

The results from an analysis of the mean scores of the achievement test revealed that no significant difference existed between the two levels of readability of the written material assessed by the Flesch Reading Ease Formula. In addition, the analysis of the achievement test scores revealed that there was a significant difference in the ability of the students to comprehend the written material taken from the first one-half and from the second one-half of the selected textbook passage. The Flesch Reading Ease Formula failed to identify the difference in content difficulty of the material in each one-half of the selected textbook passage.

The use of the cloze readability procedure in assessing the readability of college level electronics textbooks in terms of student comprehension of the material may be considered to be a reliable technique.

Comparison of the results in analyzing the difference of the mean cloze test scores over both halves of the selected textbook passage and the difference of the achievement test scores over both halves of the selected passage indicated that the cloze readability procedure and the achievement test were in agreement in assessing the written technical material selected from the college level electronics textbook.

In view of the evidence presented in this study, it is apparent that factors in addition to those included in the Flesch Reading Ease Formula should be included in the assessment of the readability of college level electronics textbooks.[1]

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[1] Dissertation Abstracts International A: The Humanities and Social Sciences (Ann Arbor, Michigan: University Microfilms, 1971), Vol. 31, No. 8, p. 3917-A. (Order No. 71-3329, 165 pages).

FROESE, VICTOR. "CLOZE READABILITY VERSUS THE DALE-CHALL FORMULA." PAPER PRESENTED AT THE ANNUAL MEETING OF THE INTERNATIONAL READING ASSOCIATION, ATLANTIC CITY, NEW JERSEY, APRIL 19-23, 1971.

Purpose: The validity of the Dale-Chall readability ratings for sixth-grade science textbooks when compared to an independent criterion of language difficulty expressed in cloze units was examined.

Principles, Concepts, or Procedures: The Canadian Lorge-Thorndike IQ Test and the Canadian Test of Basic Skills, Vocabulary and Comprehension subtests, were administered to 366 sixth graders. Mean IQ score was 102, while mean scores for vocabulary and comprehension were 6.19 and 6.15, respectively. Passages from 12 science textbooks were subjected to the cloze technique and administered to the subjects.

Conclusions: Findings revealed that (1) the 12 cloze passages yielded a reliability coefficient of .79; (2) cloze scores correlated from .55 to .85 with the intelligence measure; (3) cloze scores correlated from .64 to .86 with vocabulary, and from .52 to .85 with comprehension; (4) the cross-validation coefficient of .90 obtained by Dale and Chall and the cross-validation coefficient of .29 obtained in this study are significantly different beyond the .01 level of confidence. Major conclusions were (1) that the cloze tests are reliable measures of language difficulty and (2) that the Dale-Chall Readability Formula is not a valid measure of sixth-grade science textbook materials when the cloze procedure is used as a criterion. References are included.[1]

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[1] Research in Education (Washington, D.C.: United States Government Printing Office, 1971), Vol. 6, No. 10, p. 76. (ED 051 975, 12 pages).

FRY, EDWARD B. THE READABILITY GRAPH VALIDATED AT PRIMARY LEVELS. CAMBRIDGE, MASSACHUSETTS: COMPUTER ASSISTED INSTRUCTION LABORATORY, GRADUATE SCHOOL OF EDUCATION, HARVARD UNIVERSITY, 1969.

Purpose: The validity of the Fry Readability Graph was compared with a readability formula, the cloze technique, and oral reading.

Principles, Concepts, or Procedures: Passages from seven primary level books were ranked by the Fry Readability Graph, the Spache Readability Formula, and oral reading error scores, as well as the cloze procedure.

In the latter instance thirty second and third grade pupils read aloud from the seven book passages from which every fifteenth word was deleted if it was classified as a noun, verb, adverb, or adjective. Words of these classes nearest the fifteenth were deleted if the criterion could not be met. Scores were also obtained for the oral reading performance of the children when the words were not deleted.

Conclusions: All four methods ranked the passages well. "In my opinion the cloze method was the most accurate and made the finest distinctions." (6)

GALLANT, RUTH MARGARET FRANCES. "AN INVESTIGATION OF THE USE OF CLOZE TESTS AS A MEASURE OF READABILITY OF MATERIALS FOR THE PRIMARY GRADES." UNPUBLISHED ED.D. DISSERTATION, INDIANA UNIVERSITY, 1964.[1]

Purpose: This study dealt with two related problems, (1) the reliability and validity of cloze tests as a measure of reading comprehension for pupils in the primary grades, and (2) the effect of increased sentence length on the readability of materials designed for use with these pupils.

Principles, Concepts, or Procedures: The procedure for problem one involved the rewriting of the paragraph section of the Metropolitan Reading Achievement Tests for grades one, two, and three. A modified form of cloze procedure was devised for use with grade one. In regular cloze procedure, every fifth word is replaced by a blank line on which the subject writes his response. In the revised form used with grade one, three multiple-choice responses were provided for every deleted fifth word in the passages.

The cloze tests and a comparable form of the Metropolitan Test were administered to 273 pupils. Pearson product-moment correlation was used to determine if the rankings of pupils on the cloze test corresponded with the rankings on the standardized achievement test. Within each grade level, the correlation obtained for the boys was compared to that of the girls. A two-way analysis of variance was used to test the significance of the differences between the cloze test scores when the pupils within each grade were subdivided by sex and classified by tested reading achievement levels. The analysis was calculated for second and third grade scores, each grade level handled as a separate group.

For the second problem, two sets of passages were written, each consisting of five levels of reading difficulty as measured by the Spache readability formula. The revised passages were similar to the basal passages in number of words per passage and difficulty of vocabulary. Sentence length had been increased in the revised passages so that the Spache readability level ranged from three months to one year higher than that of the basal passages. Cloze tests over both sets of passages were administered to the 273 pupils. Differences in mean cloze performance were tested for significance of each grade level.

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[1] See also Ruth Gallant, "Use of Cloze Tests as a Measure of Readability in the Primary Grades," Appendix.

Conclusions: Findings were as follows: the correlations between the cloze tests and the standardized reading tests for each grade in total and for each grade subdivided by sex were significant. The analysis of variance corroborated the validity of cloze scores as a measure of reading comprehension. The effect of sex on cloze test performance was shown to be significant for the second and third grade scores. Although the relationship of cloze performance to the standardized test scores was essentially the same for both sexes, the analysis indicated that it was taking place at a higher level for the girls. The reliability coefficients for the cloze tests ranged from .90 to .97.

Differences in mean cloze test performance for the basal and revised passages were significant at the .01 level for both sexes and the total groups in grades one and two.

At the third grade level the difference between the means was not significant for the boys on either set of scores, exact or substitute. The difference was significant at the .05 level for the exact scores of the girls and the total exact scores.

It was concluded that cloze tests were valid and reliable measures of readability for the primary grades. Increase in sentence length appeared to increase the difficulty level of materials for first and second grade pupils, but this increase did not hold true for all subgroups of grade three.[1]

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[1] Dissertation Abstracts (Ann Arbor, Michigan: University Microfilms, 1965), Vol. 25, No. 11, pp. 6431-6432. (Order No. 65-2370, 152 pages).

HOUSKA, JOSEPH THOMAS. "THE EFFICACY OF THE CLOZE PROCEDURE AS A READABILITY TOOL ON TECHNICAL CONTENT MATERIAL AS USED IN INDUSTRIAL EDUCATION AT THE HIGH SCHOOL LEVEL." UNPUBLISHED ED.D. DISSERTATION, UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN, 1971.

Purpose: To ascertain the efficacy of the Cloze Procedure as a readability tool on technical content material.

Principles, Concepts, or Procedures: Nine technical content passages (three from each field) were drawn from the automotive, woods, and electronics industrial education fields. Each passage was approximately 350 words in length. An assessment of readability of each passage was made by use of the Flesch Reading Ease Formula. Then, by manipulation of the two factors of the Flesch formula, the three passages of each technical field were re-written to 7th, 10th, and 13th grade levels of readability. A cloze test and a 22-item comprehension test was developed over each passage. The cloze test was of the every 5th word deletion type while the 22-item comprehension test consisted of four measures of specific comprehension skill, i.e., meaning of technical and non-technical vocabularies, recognition of factual statements, and relationships.

The subjects (N=99) were obtained from the larger industrial education population (N=223) on the basis of their completing all nine cloze and comprehension tests and having available standardized measures of IQ and reading achievement. A t test between means of the sample population and the larger population, on IQ and reading achievement test scores, indicated the study population to be representative of the larger population. Furthermore, on the basis of the standardized reading achievement scores, the sample population was divided into three groups of high, medium, and low in reading ability.

The administration of the tests was conducted in the regular classroom meeting. The cloze test was presented first, before the subjects had read the passage. Eleven days later, the subjects read each passage and responded to the 22-item comprehension test over the passage. Analysis of the hypotheses of this study was based on the results of these two tests.

Conclusions: Split-half test reliabilities were computed for each of the nine comprehension and cloze tests, and when corrected for attenuation by the Spearman-Brown Prophecy formula, yielded reliabilities from .58 to .88 for the comprehension tests and .73 to .92 for the cloze tests. Pearson r correlation coefficients were computed between cloze and comprehension tests over the same technical content passage (r=.383 to .609), corrected for attenuation); between cloze tests and measures of specific comprehension skills (r=.115 to .497); and between cloze tests and IQ (r=.29 to .52) and cloze tests and reading achievement (r=.27 to .57). All were significant at the .05 level.

Spearman rho rank order correlation coefficients were computed between comprehension and cloze tests rank ordering of the nine passages and across levels of students' reading ability (rhos = .86 to .98); between cloze test and Flesch Reading Ease Formula rank ordering of the three passages of each technical field, (rhos = .50 to 1.00) and between the comprehension and cloze tests rank ordering of the three different technical fields used in this study (rho = 1.00). A simple one-way analysis test, followed by a Newman-Keuls test, was computed across levels of reading ability for each cloze test to verify if significant differences existed in the rank ordering process by the different ability groups. All F ratios were significant at the .05 level.

The cloze procedure, when used on technical content materials, was demonstrated to:

1. identify the relative readabilities of the passages similar to the comprehension test technique;
2. identify the relative readabilities of the passages similar to the Flesch Reading Ease Formula;
3. discriminate between readers of varying reading abilities;
4. identify which technical content fields were relatively more readable;
5. relate, with low correlations, with standardized measures of students' abilities.[1]

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[1] Dissertation Abstracts International A: The Humanities and Social Sciences (Ann Arbor, Michigan: University Microfilms, 1972), Vol. 32, No. 8, pp. 4500-A, 4501-A. (Order No. 72-6957, 199 pages).

JEFFERSON, GEORGE LEE, JR. "LEXICAL AND STRUCTURAL ITEMS AS PREDICTORS OF READABILITY FOR HIGH AND LOW ABILITY READERS." UNPUBLISHED PH.D. DISSERTATION, UNIVERSITY OF GEORGIA, 1969.[1]

Purpose: This study is an attempt to clarify the use of cloze techniques in the measurement of reading comprehension and of written language difficulty.

Principles, Concepts, or Procedures: The three variables tested were Reading Ability, Readability, and Deletion Type. The deletion categories were nth (every-fifth word), lexical (nouns, main verbs, adjectives), and structural (the traditional parts of speech not categorized as lexical). These three kinds of deletions were made over each of the three passages which had been constructed from easy, middle difficulty, and hard reading material. The passages used were those which Bormuth (1966) ranked for difficulty using averaged nth unit forms over each passage.

Four hundred and sixty-six subjects, eighth through twelfth grades were stratified into three reading ability levels, and randomly assigned to one of nine treatment combinations within each reading ability level.

Conclusions: The data were analyzed by a three-way analysis of variance, based on assumptions of fixed effects model. There were significant main effects of reading ability and of deletion types. There was one significant interaction between deletion types and reading difficulty. This was not predicted.

The findings of this study strongly suggest that the cloze is potentially a strong research tool in the study of language and reading, but at present it is not a highly valid measure of reading comprehension or of passage difficulty. The significant differences among the three deletion types show that the language categories in this study represent at least two major distinct linguistic variables, and the lexical and structural units operate in basically different ways.

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[1] See also George L. Jefferson, Jr., "Lexical and Structural Items as Predictors of Readability for High and Low Ability Readers," Appendix.

The significant interaction between deletion type and readability strongly urges that the use of nth word cloze tests, averaged across a passage, does not reflect the essential differences between content (semantic meaning) and structural (relationship meanings) units in the language. And further, no meaningful estimate of comprehension or passage difficulty may be made from averaged nth unit deletion scores. The use of other linguistic variables rank order the passages in contradictory ways from the nth-unit averaged score ranking.

The results of this study, using random assignment of subjects and non-repeated measures, suggest a need for careful experimental manipulation of the language variables which correlational techniques have pointed out. The kind of design and the type of statistical treatment employed need careful scrutiny if language experiments with the cloze are to make useful contributions to language research.[1]

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[1] Dissertation Abstracts International A: The Humanities and Social Sciences (Ann Arbor, Michigan: University Microfilms, 1970), Vol. 30, No. 12, p. 5287-A. (Order No. 70-10,200, 152 pages).

KULM, GERALD. "MEASURING THE READABILITY OF ELEMENTARY ALGEBRA USING THE CLOZE TECHNIQUE." PAPER PRESENTED AT THE ANNUAL MEETING OF THE AMERICAN EDUCATIONAL RESEARCH ASSOCIATION, NEW YORK, N. Y., FEBRUARY 4-7, 1971.

Purpose: The relationship to readability of ten variables characterizing structural properties of mathematical prose was investigated in elementary algebra textbooks.

Principles, Concepts, or Procedures: Readability was measured by algebra students' responses to two forms of cloze tests. Linear and currilinear correlations were calculated between each structural variable and the cloze test.

Conclusions: The results indicated that explanatory material, sentence length, percentage of mathematical symbols and percentage of difficult words had significant linear correlations with readability. In illustrative material, percentage of mathematical symbols and percentage of mathematics vocabulary had significant linear correlations with readability. Departures from linearity were significant for sentence length and percentage of reader-directed sentences in explanatory material, and percentage of difficult words in illustrative material. /Not available in hardcopy due to marginal legibility of original document./[1]

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[1] Research in Education (Washington, D.C.: United States Government Printing Office, 1971), Vol. 6, No. 6, pp. 112-113. (ED 047 972, 24 pages).

LISKE, WILFRED WALLACE. "THE CLOZE PROCEDURE FOR DETERMINING READABILITY OF ENCYCLOPEDIA MATERIAL FOR ELEMENTARY SCHOOL PUPILS." UNPUBLISHED ED.D. DISSERTATION, UNIVERSITY OF MARYLAND, 1968.

Purpose: The purpose of the study was (1) to employ the cloze procedure of test construction and evaluation in assessing the readability of selected juvenile encyclopedia material for children in grades four, five, and six, and (2) to compare the results of cloze evaluation with readability formula grade-placement levels of the same material.

Principles, Concepts, or Procedures: Fifteen encyclopedia articles corresponding to social studies and science topics studied in grades four, five, and six were selected at random from the 1967 edition of the World Book. Fifty-item cloze tests were constructed on the beginning, middle, and ending sections of each article.

The forty-five tests were assigned randomly to 1,199 pupils drawn at random from the total fourth, fifth, and sixth-grade population in two public school districts in South West Michigan. The tests were administered by the classroom teachers in March, 1968. Mean cloze scores were calculated for each grade and each article.

Grade-placement levels were estimated for each selected encyclopedia passage by the application of the Yoakam and Dale-Chall readability formulas.

Conclusions: To fulfill the purpose of the study, answers were sought for two major questions and two sub-questions.

1. Does readability as measured by cloze procedure indicate that selected materials from the World Book Encyclopedia are readable for children in grades four, five, and six?

A readability criterion of 75/75 was set by this study, i.e., seventy-five percent of the pupils in a grade were required to reach a minimum cloze score corresponding to seventy-five percent correct responses on a multiple-choice comprehension test. According to the criterion, the selected reference materials were not readable for the population tested. The pupils that were successful in reaching the minimum (twenty-two percent of the total population) had a mean IQ (Lorge-Thorndike) of 114 and a mean reading achievement level (Stanford) of 1.4 grades above the mean reading achievement level of the total population.

Sub-questions one (a) and (b) asked whether there were significant differences among and within the selected encyclopedia articles. Earlier research had indicated a wide range of grade-placement levels among this type of material. Publishers of World Book claim that they adapt longer articles to a wide range of readers by lowering the readability difficulty of the beginning sections. No significant differences (two-way analysis of variance test, $p < .01$) were found among the mean cloze test scores of the fifteen articles. Significant differences ($p < .01$) were found within articles. Two-way analysis of variance test on the mean reading achievement levels showed no significant differences in reading achievement among the groups completing the cloze tests on the various articles ($p < .01$).

2. Does readability of selected World Book Encyclopedia material as indicated by cloze test results correspond with the grade-placement level of the same material as indicated by readability formulas? In answer to this question, Pearson Product-Moment correlation coefficients were calculated between cloze test results and formula grade-placement levels according to Dale-Chall and Yoakam readability formulas. A negative correlation was expected since higher grade-placement levels should result in lower cloze scores. Significant correlations ($p < .01$) of from -.58 to -.70 were found for middle and ending sections of articles, but not for beginning sections. The following conclusions resulted:

1. Only the more able readers were able to cope with the selected World Book Encyclopedia (1967 edition) reference materials.

2. The readability difficulty among the selected articles does not vary to a significant extent.

3. The claim of the publishers of World Book that the readability difficulty increases within the total article was substantiated.

4. Cloze procedure used in evaluating encyclopedia material substantiated the claims of readability research that cloze tests are reliable and valid for measuring readability of prose passages.

5. There were some significant correlations between cloze test results and readability formula grade placement levels. The correlations were not high possibly due to the limitations of the readability formulas and the different approaches used. Cloze procedure seems to follow more consistently the actual difficulty of the reading material.[1]

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[1] Dissertation Abstracts A: The Humanities and Social Sciences (Ann Arbor, Michigan: University Microfilms, 1969), Vol. 29, No. 12, Part 1, pp. 4189-A, 4190-A. (Order No. 69-9590, 160 pages).

MACGINITIE, WALTER HAROLD. "CONTEXTUAL CONSTRAINT IN ENGLISH PROSE." UNPUBLISHED PH.D. DISSERTATION, COLUMBIA UNIVERSITY, 1960.[1]

Purpose: Restorations of words and groups of words omitted periodically from English prose were studied as indicators of the way in which the choice of words is determined by context.

Principles, Concepts, or Procedures: Since this form of the completion method has received extensive recent use with little recognition of many similar past applications, some of the more important developments in the history of the completion method were outlined. Previous developments in the study of language redundancy were also described.

The patterns of omission which were used permitted comparison of the predictability of given words when different amounts of context were removed as periodic omissions in paragraphs. The usefulness of various criteria of correct prediction was studied in terms of frequency and reliability, and, as a result of this evaluation, two different criteria were chosen for use in the analysis of the data. Restorations were counted correct in one case only if they were exact restitutions of the original words, and, in the other case, all rationally and grammatically acceptable restorations were counted.

Words were restored in two descriptive paragraphs differing in style and difficulty. Results, based on different subjects, were substantially the same for both paragraphs. Each different set of omitted words was restored by 20 different college students.

Conclusions: A comparison of the restorations in the different omission patterns led to the following results: (1) There was no reliable difference in difficulty of restoration when every 24th, 12th, or 6th word was omitted, but omitting every 3rd word did make restoration more difficult. (2) When words were omitted in pairs, there was no reliable difference in difficulty of restoration, regardless of whether 22, 10, or only 4 words of context were left between each omitted pair. (3)

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[1] See also Walter H. MacGinitie, "Contextual Constraint in English Prose Paragraphs," Appendix.

Words omitted in groups of four were more difficult to restore than words omitted in pairs, and pairs were in turn more difficult to restore than single words. (4) Omitting an adjacent word made restoration more difficult, but it made no difference whether the additional omitted word preceded or followed the word to be restored. When each omitted word was scored separately, the above results were obtained regardless of whether all acceptable restorations were counted correct or whether return of the original word was required. When each group of adjacent omitted words was scored as a unit, the above results were also obtained for both scoring criteria, except that increasing size of omitted word-group had little effect on the number of exact plus acceptable restorations.

These findings were interpreted as indicating that contextual constraints upon words in English prose decline rapidly with increasing distance of the context and that context beyond about five words has little effect on word choice. Some implications of this conclusion for the relation of context to understanding were discussed.

A consideration of the relation of context to the ability of subjects to supply a word which is both rationally and grammatically acceptable in the rest of the passage suggested that neither the form nor the content of written English may be much constrained beyond about five words and that units in which thoughts are composed may seldom be greater than this length.[1]

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[1] Dissertation Abstracts (Ann Arbor, Michigan: University Microfilms, 1960), Vol. 21, No. 1, pp. 126-127. (L. C. Card No. Mic 60-2020, 171 pages).

MILLER, G. R., AND COLEMAN, E. B. "A SET OF THIRTY-SIX PROSE PASSAGES CALIBRATED FOR COMPLEXITY." JOURNAL OF VERBAL LEARNING AND VERBAL BEHAVIOR, 6 (1967), 851-854.

Purpose: A set of prose passages was calibrated for complexity by means of the cloze procedure.

Principles, Concepts, or Procedures: Thirty-six passages drawn mainly from Standard Test Lessons in Reading were altered so that each contained exactly 150 words and ranged in difficulty from first-grade to technical prose. For each passage three types of cloze tests were constructed.

The first utilized every-fifth-word deletion. Five forms were constructed, each beginning with a different deletion so that each word became a cloze item eventually. Six booklets of six tests each were compiled, alternating easy and difficult passages.

The second type of cloze test allowed the subject to use all the constraint in a passage to determine the deletion, for 150 forms were made with only one deletion in each.

The third type demanded that the subject predict each of the 150 words beginning with the first. Each correct word was revealed after a response had been made.

Subjects were 479 college students. The first cloze test had time limits. Correct exact replacements were accepted as well as synonyms and form classes. Subjects given test two were allowed unlimited time but had to replace the word exactly. In test three a new word was exposed every seven seconds. Only exact replacements were scored correct.

Conclusions:

1. The correlation of .99 between the weighted scores and the exact replacement scores in test one indicates that the simpler method of accepting only exact replacements is a valid and reliable one.

2. Test three yielded the lowest percentage of correct responses and test two, the highest.

3. All three tests ranked the passages for difficulty in approximately the same manner.

4. The lack of increase in correct responses from word 20 to word 140 in test three indicates that the responses are constrained very slightly, if at all, by words from other sentences.

RENTEL, VICTOR MICHAEL. "FORM CLASS AND WORD LENGTH AS INDICES OF THE DIFFICULTY OF PREDICTING CLOZE ENTRIES IN A SAMPLE OF CONTINUOUS PROSE." UNPUBLISHED PH.D. DISSERTATION, UNIVERSITY OF SOUTH CAROLINA, 1969.

Purpose: The study examined the difficulty of predicting four categories of words at three levels of word length on a cloze test of reading comprehensions.

Principles, Concepts, or Procedures: Grammatical classification was based on that of C. C. Fries with Form Class I roughly corresponding to nouns, pronouns, and nominalizations; Form Class 2 to verbs; Form Class 3 to adjectives; and Function Words to those words not capitalized in titles. Category limits for word length were defined by letters per word (2-4, 5-7, 8-16). One hundred and fifty subjects were selected on a convenience basis from among juniors and seniors majoring in education enrolled at both the University of South Carolina and the University of Tennessee. A selection of 5,218 words of continuous prose from an essay entitled "How to Be an Employee" comprised a controlled (Flesch Reading Ease Formula - .69) language sample.

Scores representing the difficulty of each grammatical category, each word length category, and the combination of both were compared using a multivariate analysis of variance for a repeated measures, multifactor experiment. Data analysis was performed by means of a computer program developed specifically for this study for use on the IBM 7040 computer. The program made overall tests on within-subjects effects through the use of Hotelling's $\underline{T}^2$ statistic, a multivariate analogue of the square of $\underline{t}$. All differences were significant beyond the .005 level.

Conclusions: Analysis indicated that as words increased in length, the difficulty of predicting their occurrence in a passage increased significantly across all language categories but not uniformly so. Form Class 3 appears least affected by increasing word length and more significantly difficult to predict than were other categories. But for words over seven letters long, Form Class 2 was slightly more difficult to predict than Form Class 3, and both were significantly more difficult to predict than was Form Class 1. Significant interactions occurred between word length and Form Class categories.

Typically, these interactions were wholly the result of variations in the differences between categories. Significant interaction effects were mainly accounted for by the difficulty imposed on prediction by Form Class 3. For all categories of words over seven letters in length, length appeared to take precedence as a source of difficulty and was affected only slightly by variation in Form Class.

Warnings against generalization from these results both to other levels of passage difficulty and to other subjects were stressed.

Appendices include raw cloze test scores, lists of words deleted in each category, a sample cloze test, summary source tables, a description of the nonprofile data analysis, illustrative scatter plots, and a table of test reliabilities for each of the eleven categories.[1]

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[1] Dissertation Abstracts International A: The Humanities and Social Sciences (Ann Arbor, Michigan: University Microfilms, 1970), Vol. 30, No. 10, p. 4284-A. (Order No. 69-20,113, 138 pages).

TAYLOR, WILSON L. "'CLOZE PROCEDURE': A NEW TOOL FOR MEASURING READABILITY." JOURNALISM QUARTERLY, 30 (1953), 414-438.

Purposes:

In Experiment One, the author sought to determine if cloze scores would "rank" passages taken from the writings of Boswell, Huxley, and James as did the Flesch and Dale-Chall formulae.

In Experiment Two, the author hypothesized that

1. the results of Experiment One would be validated.
2. the readability order of eight passages taken from the writings of Caldwell, Stein, and Joyce would be predicted by the rank order of the cloze scores given them by a panel of subjects.
3. the cloze procedure would handle materials either or both the Flesch and Dale-Chall formulae could not.

Principles, Concepts, or Procedures:

Experiment One: Three passages were administered to 24 college juniors and seniors. All were approximately 175 words in length and were mutilated by three systems. Scores were computed on the basis of exact-word and synonym replacement. Pilot studies were run in advance.

Experiment Two: Eight passages were administered to 72 subjects each of whom completed two--an easy one and a harder one. Other procedural aspects were similar to Experiment One.

Conclusions:

Experiment One:
1. Cloze scores consistently ranked the passages as did the formulae. Qualitatively the three mutilation systems yielded the same results. Quantitatively, however, there were some differences. Exact-word and synonym scoring yielded virtually identical results.

Experiment Two:
1. The results of Experiment One were validated.
2. The ranking given by the panel almost perfectly predicted those given subjects in the experiment.
3. Cloze was superior to either of the formulae in predicting readability.

Though the traditional formulae are reasonably accurate and reliable and do possess a number of advantages over the cloze procedure, certain language elements are not handled as well by the former as the latter.

TAYLOR, WILSON LEWIS. "APPLICATION OF 'CLOZE' AND ENTROPY MEASURES TO THE STUDY OF CONTEXTUAL CONSTRAINT IN SAMPLES OF CONTINUOUS PROSE." UNPUBLISHED PH.D. DISSERTATION, UNIVERSITY OF ILLINOIS, 1954.

Purpose: Relationships between the author's "cloze procedure" and the entropy or "uncertainty" measure of modern information theory were explored in an experiment based on the attempts of subjects to replace words that had been mechanically deleted from meaningful prose material. Certain aspects of the application, nature, and methodology of the cloze method also were investigated.

Principles, Concepts, or Procedures: Two sample passages, each containing 175 experimental words in sequence, were taken from each of two essays, X and Y. Previous pilot studies had indicated that X was significantly "easier" to comprehend than Y, as gauged by the larger proportion of missing X words correctly replaced.

Each passage was mutilated by counting out every fifth word, or 35 words altogether. The operation was repeated four times, beginning with different words, to yield five deletion versions that together took out all 175 words. Each version of each passage was reproduced on a separate page with a standard-size blank in place of each missing word. A test assembly included one version of all four passages and contained 140 (4 x 35) blanks. The five deletion versions and the alternation of the order in which essays were represented produced ten kinds of assemblies, which were randomly distributed among about 300 freshman rhetoric students.

Assemblies returned by 287 subjects were considered sufficiently filled in for the first stage of analysis; those that exhibited a whole passage with all blanks left unfilled were discarded.

A subject's guess on any particular blank was scored as right only if it "closed the gap" in the word sequence by proposing the same word as the original one deleted. Any subject's cloze score was simply the total of his correct guesses. The sum of its subjects' scores was the cloze score of any set of material.

Initial analysis showed: (1) No significant difference between X-then-Y and Y-then-X orders of presentation; (2) significantly higher scores for subjects exposed to either essay nearly two months before than for those not previously exposed to it; (3) significantly higher scores for X than Y, as pilot studies had predicted; (4) a significant overall difference among deletion versions for each essay.

The subject total was reduced to 250 - 50 in each deletion-version group - by discarding assemblies with the most blanks unfilled. Then, in addition to scoring subjects and materials, cloze scores were allocated to individual blanks; that is, each of the 175 words was assigned the proportion of subjects (out of 50) that correctly guessed its identity from context.

Conclusions: Subsequent analysis indicated: (1) a tendency for the accumulated percentage scores for each passage's five different deletion versions to converge as more successive words were taken into account; (2) a tendency for the mean cumulative percentage score of all deletion versions to stabilize within the first 20 to 40 words of each passage; (3) approximately normal distribution of the cloze scores of subjects for each essay; (4) abnormal distribution of the cloze scores allocated to blanks (missing words), with more scores falling at the extremes than in the middle of the distribution for any passage.

Exploration of the relationships between cloze and entropy measures was confined to the 250 subjects' performance on one passage from X essay. Each blank and its context of surrounding words constituted an individual "system," the entropy of which was computed from the relative frequencies with which each alternative was proposed by 50 subjects trying to guess the missing word. Computation used the basic formula for "average entropy":

$$H = - \underset{i}{} p_i \log_2 p_i$$

The correlation scattergram between cloze and uncertainty measures for each of the 175 words was abnormal. The rank-difference correlation between the distributions reached a highly significant value of -.87.

When, for each word in series, the cloze percentage and its paired relative uncertainty estimate were plotted in opposition on a 100-point scale, about half the pairs exhibited a roughly complementary relationship. Exploration revealed that any cloze percentage is precisely complementary to the "maximum remaining relative uncertainty" of the system concerned. Such "maximum remaining" values were computed by removing the proportion of cloze responses from any set of response alternatives, calculating the maximum absolute uncertainty of the possible alternatives remaining (as if all "wrong" alternatives), and then dividing by the maximum uncertainty for the whole system that included the cloze proportion.

Many of the 175 word-response systems yielded actual remaining uncertainty values much smaller than their corresponding maximums. The difference between the observed and maximum values was assumed to be that part of any system's total response performance not explained by organization toward production of the "correct" response, or by mere disorganization (uncertainty), or even by both together. The difference appeared to involve an active influence that misdirected, that tended to make subjects agree on a "wrong" response, and this difference was postulated to be an "index of misdirection." The following formula was proposed to express total performance with regard to any blank's system:

$$\text{Cloze } \% + \text{Rem.Rel.H} + \text{Misdirection} = 1.00$$

All three sorts of measures were computed for each word in series, and analysis showed all three distributions to be normal. The rank correlation coefficient of the cloze and remaining relative uncertainty distributions was -.83.

Various ways in which cloze procedure could be applied to communication problems, at various places in the process that links encoder and decoder, were illustrated and discussed.[1]

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[1] Dissertation Abstracts (Ann Arbor, Michigan: University Microfilms, 1955), Vol. 15, No. 3, pp. 464-465. (Publication No. 10,554, 127 pages).

CHAPTER III

THE CLOZE PROCEDURE AS A MEASURE OF COMPREHENSION

The relationship of numerous aspects of comprehension to the cloze procedure has been variously examined. Bormuth[1] assessed the factor validity of cloze tests as measures of reading comprehension, while Cranney[2] compared two types of cloze reading tests for validity and reliability.

Numerous studies have examined the cloze procedure as a technique for measuring reading comprehension. Jenkinson, as reported by Rankin,[3] obtained correlations with cloze scores of .78 and .73 with the vocabulary and comprehension sections of the Cooperative Reading Test. Using the same test, Fletcher[4] obtained correlations of

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[1] Bormuth, "Factor Validity of Cloze Tests as Measures of Reading Comprehension Ability," Reading Research Quarterly, 4 (1969), 358-365.

[2] Adelbert Garr Cranney, Jr., "A Comparison of a Free-Response and Multiple-Choice Cloze Reading Test" (unpublished Ph.D. dissertation, University of Minnesota, 1968).

[3] Rankin, "The Cloze Procedure - Its Validity and Utility," p. 138.

[4] Junior Eugene Fletcher, "A Study of the Relationships Between Ability to Use Context as an Aid in Reading and Other Verbal Abilities" (unpublished Ph.D. dissertation, University of Washington, 1959).

.63 and .55 respectively.

Using the Diagnostic Reading Test, Rankin[1] found correlations of .68 and .60 between vocabulary and comprehension, and cloze scores. Ruddell[2] obtained correlations ranging from .61 to .74 between cloze scores and the Stanford Achievement Test, Paragraph Meaning sub-test.

In her study, Gallant[3] found correlations ranging from .65 to .81 with the Paragraph Reading section of the Metropolitan Achievement Test, Primary Batteries I and II and Elementary Reading Test.

Using every-tenth-word deletions, Schneyer[4] found correlations of .74 with vocabulary and .68 with comprehension when the Gates Reading Survey was used. When noun-verb deletions were made, the correlations were .63 and .60 respectively.

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[1] Rankin, "An Evaluation of the Cloze Procedure as a Technique for Measuring Reading Comprehension" (unpublished Ph.D. dissertation, University of Michigan, 1958).

[2] Robert Byron Ruddell, "An Investigation of the Effect of the Similarity of Oral and Written Patterns of Language Structure on Reading Comprehension" (unpublished Ed.D. dissertation, Indiana University, 1963).

[3] Gallant, "An Investigation of the Use of Cloze Tests as a Measure of Readability of Materials for the Primary Grades."

[4] J. Wesley Schneyer, "Use of the Cloze Procedure for Improving Reading Comprehension," The Reading Teacher, 19 (1965), 174-179.

As a measure of specific comprehension, cloze scores have been correlated with scores from comprehension tests based on the same material. Taylor[1] found correlations ranging from .51 to .92, while Jenkinson, as reported by Rankin,[2] found a single correlation of .82. Bormuth[3] found a single correlation of .93.

The cloze procedure as a technique for measuring reading comprehension in specific situations has been the subject of much investigation.

The effects on comprehension tests of various lexical deletions were studied by Bradley.[4]

Swalm[5] investigated the effects on reading comprehension, as measured by the cloze procedure, of the oral reading, silent reading, and listening of second, third, and fourth grade students, while Daugherty[1] measured the reading comprehension of fourth grade students.

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[1] Taylor, "Recent Developments in the Use of 'Cloze Procedure'"; Wilson L. Taylor, "Cloze Readability Scores as Indices of Individual Differences in Comprehension and Aptitude," Journal of Applied Psychology, 41 (1957), 19-26.

[2] Rankin, "The Cloze Procedure - Its Validity and Utility," p. 138.

[3] Bormuth, "Cloze Tests as Measures of Readability and Comprehension Ability (unpublished Ed.D. dissertation, Indiana University, 1962).

[4] Michael Bradley, "Effects on Reading Tests of Deletions of Selected Grammatical Categories" (paper presented at the National Reading Conference, Atlanta, Georgia, December 4-6, 1969.

[5] James E. Swalm, "Comparison of Oral Reading, Silent Reading, and Listening Comprehension Assessed by Cloze" (unpublished Ed.D. dissertation, Rutgers University, The State University of New Jersey, 1971).

Sikes[2] utilized the cloze procedure to assess fifth and sixth grade children's comprehension of original and published materials.

The cloze procedure as a measure of the reading comprehension of selected Mexican-American and Anglo-American elementary school children was analyzed by Crawford.[3]

Geyer[4] utilized the cloze procedure as a predictor of the ability of junior high school students to comprehend social studies materials.

The reading performance of selected students on occupation information materials written at various readability levels was determined by Knight.[1]

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[1] Joan Daugherty, "The Effect of the Cloze Procedure and Interspersed Questions as an Aid to Reading Comprehension" (unpublished Ph.D. dissertation, the University of Akron, 1971).

[2] Helen Cruse Sikes, "A Comparative Study of Cloze Procedure Scores on Original and Published Materials" (unpublished Ed.D. dissertation, University of Southern Mississippi, 1971).

[3] Alan Neal Crawford, "The Cloze Procedure as a Measure of the Reading Comprehension of Elementary Level Mexican-American and Anglo-American Children" (unpublished Ed.D. dissertation, University of California, Los Angeles, 1970).

[4] James Rush Geyer, "The Cloze Procedure as a Predictor of Comprehension in Secondary Social Studies Material" (unpublished Ed.D. dissertation, University of Maryland, 1970).

Hater[2] assessed the comprehensibility of mathematical English in grades seven through ten.

Greene[3] and Rankin[4] evaluated the cloze procedure as a technique for measuring the reading comprehension of college students.

Fletcher[5] utilized the cloze technique to measure the ability of college freshmen to use context, while Feldman[6] assessed the learning accrued from programmed and text presentations of an introductory college psychology program.

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[1] David W. Knight, "The Reading Performance of Students With Ninth Grade Reading Achievement on Occupational Information Materials Written With Various Levels of Readability" (unpublished Ph.D. dissertation, The Florida State University, 1966).

[2] Sister Mary Ann Hater, "The Cloze Procedure as a Measure of the Reading Comprehensibility and Difficulty of Mathematical English" (unpublished Ph.D. dissertation, Purdue University, 1969).

[3] Frank Pierrepont Greene, "A Modified Cloze Procedure for Assessing Adult Reading Comprehension" (unpublished Ph.D. dissertation, The University of Michigan, 1964).

[4] Rankin, "An Evaluation of the Cloze Procedure as a Technique for Measuring Reading Comprehension."

[5] Fletcher, "A Study of the Relationships Between Ability to Use Context as an Aid in Reading and Other Verbal Abilities" (unpublished Ph.D. dissertation, University of Washington, 1959).

[6] Margaret Eichbauer Feldman, "The Effects of Learning by Programed and Text Format at Three Levels of Difficulty" (unpublished Ph.D. dissertation, Cornel University, 1964).

Guthrie[1] studied the effect of delayed, immediate, and omitted cloze testing on the comprehension of prose sentences by college students, and Sawyer and Braam[2] investigated the effect of instruction in speed of comprehension upon reading comprehension developed from cloze exercises.

The relationships between cloze scores and selected variables, such as intelligence, have been studied by Hafner, Gwaltney, and Robinson; Kohler; Lisman; Taylor; and Weaver _et al_.[3]

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[1] John T. Guthrie, _Motivational Effects of Feedback in Reading_ (Baltimore, Maryland: Center for the Study of Social Organization of Schools, Johns Hopkins University, 1971).

[2] Rita Sawyer and Leonard S. Braam, "An Experiment Combining Cloze Procedure With Speed of Comprehension Instruction," _Proceedings of the College Reading Association_, ed. by Clay A. Ketcham (Syracuse, New York: College Reading Association, 1964, pp. 27-33.

[3] Lawrence E. Hafner, Wayne Gwaltney, and Richard Robinson, "Reading in Bookkeeping: Predictions and Performance," _Journal of Reading_, 14 (1971), 537-546; Emmett Theodore Kohler, "An Investigation of Cloze Scores in Terms of Selected Cognitive Variables" (unpublished Ed.D. dissertation, The Florida State University, 1966); Linda C. Lisman, "Vowel Deletion and Cloze Tests Compared With a Reading Ability Test" (unpublished Master's thesis, Rutgers, The State University of New Jersey, 1971); Wilson L. Taylor, "Cloze Readability Scores as Indices of Individual Differences in Comprehension and Aptitude," _Journal of Applied Psychology_, 41 (1957), 19-26; and Wendell Weaver, Albert J. Kingston, A. C. Bickley, and William F. White "Information-Flow Difficulty in Relation to Reading Comprehension," _Journal of Reading Behavior_, 1 (1969), 41-49.

Comparable cloze and multiple-choice scores have been investigated by Bormuth; Mosberg, Potter, and Cornell; and Rankin and Culhane.[1]

The concept of information gain has been studied by means of the cloze procedure. Carver[2] examined the exact scoring of cloze replacements as measures of information gained from reading.

Coleman and Miller[3] and Rankin and Dale[4] studied information gain by using the cloze procedure with college students.

Information gain when individualized and traditional textbook approaches to science instruction were used with fifth-grade students was investigated by Charles.[1]

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[1] Bormuth, "Comparable Cloze and Multiple-Choice Comprehension Test Scores," *Journal of Reading*, 10 (1967), 291-299; Ludwig Mosberg, Thomas C. Potter, and Robert K. Cornell, *The Relation Between Cloze and Multiple-Choice Test Scores as a Function of Relative Paragraph Difficulty and Grade Level* (Inglewood, California: Southwest Regional Laboratory for Educational Research and Development, 1968); and Earl F. Rankin and Joseph W. Culhane, "Comparable Cloze and Multiple-Choice Comprehension Test Scores," *Journal of Reading*, 13 (1969), 193-198.

[2] Ronald P. Carver, "What Is Reading Comprehension and How Should It Be Measured?" (paper presented at the National Reading Conference, Atlanta, Georgia, December 4-6, 1969.

[3] E. B. Coleman and G. R. Miller, "A Measure of Information Gained During Prose Learning," *Reading Research Quarterly*, 3 (1968), 369-386.

[4] Earl F. Rankin and Lothar H. Dale, "Cloze Residual Gain - A Technique for Measuring Learning Through Reading," *The Psychology of Reading Behavior*, ed. by G. B. Schick and M. M. May, Eighteenth Yearbook of the National Reading Conference (Milwaukee, Wisconsin: National Reading Conference, 1968), pp. 17-26.

The influences of several properties of the English language on comprehension have been examined. Bormuth[2] investigated the relationships between mean word depth and comprehension difficulty, as well as the influence of length of independent clauses on these two variables.

Coleman[3] studied the effects of shortening sentences on comprehension of college students, while Darnell[4] assessed the influences of sentence order on the comprehension of college students.

Smith[5] investigated the relationships between the maturity of syntactic structures and reading comprehension at selected grade levels, while the effect of the similarity of oral and written patterns of language structure on reading comprehension was studied by Ruddell.[1]

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[1] Edward Charles, "An Investigation of the Use of Cloze Tests to Compare Gain Scores of Students in Science Who Have Used Individualized Science Materials and Those Who Have Used Traditioral Textbook Materials" (unpublished Ed.D. dissertation, Lehigh University, 1970).

[2] Bormuth, "Mean Word Depth as a Predictor of Comprehension Difficulty," California Journal of Educational Research, 15 (1964), 226-231; John R. Bormuth, "New Measures of Grammatical Complexity," The Psycholinguistic Nature of the Reading Process, ed. by Kenneth S. Goodman (Detroit: Wayne State University Press, 1968), pp. 239-253.

[3] E. B. Coleman, "Improving Comprehensibility by Shortening Sentences," Journal of Applied Psychology, 46 (1962), 131-134.

[4] Donald K. Darnell, "The Relation Between Sentence Order and Comprehension," Speech Monographs, 30 (1963), 97-100.

[5] William Lewis Smith, "The Effect of Syntax on Reading" (unpublished Ph.D. dissertation, The Florida State University, 1969).

The effect of interest on reading comprehension was measured, in part, by the cloze procedure in a study undertaken by Henry.[2]

Rankin and Hess[3] assessed internal reading flexibility, and Bloomer and Heitzman[4] examined the effects of cloze pre-testing on reading comprehension.

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[1] Ruddell, "An Investigation of the Effect of the Similarity of Oral and Written Patterns of Language Structure on Reading Comprehension."

[2] Peggy Elaine Henry, "The Effect of Interest on Reading Comprehension as Measured by Cloze and Multiple Choice Tests" (unpublished Ph.D. dissertation, The University of Iowa, 1969).

[3] Earl F. Rankin and Allen K. Hess, "The Measurement of Internal (Intra-Article) Reading Flexibility" (paper presented at the National Reading Conference, Atlanta, Georgia, December 4-6, 1969).

[4] Richard H. Bloomer and Andrew J. Heitzman, "Pretesting and the Efficiency of Paragraph Reading," Journal of Reading, 8 (1965), 219-223.

BLOOMER, RICHARD H., AND HEITZMAN, ANDREW J. "PRE-TESTING AND THE EFFICIENCY OF PARAGRAPH READING." JOURNAL OF READING, 8 (1965), 219-223.

Purpose: The author examined ". . . the relationship between information presented to the student in short selections and his comprehension of the material." (219)

Principles, Concepts, or Procedures: Materials were five of the most difficult passages in the McCall-Crabbs Standard Test Lessons in Reading.

Subjects were 146 students enrolled in six eighth grade classes.

> Treatment Group A was given the pre-test followed by the reading selection, followed in turn by a post-test which was identical to the pre-test. Treatment Group B was given the reading selection followed by the post-test. Treatment Group C was presented with the reading selection adapted for Cloze procedure by the omission of every tenth word, followed by the post-test. Treatment Group D was given the pre-test, followed by the Cloze procedure reading materials, followed by the post-test. (219)

Conclusions: Among the conclusions were the following:

1. The response strength of the wrong response was decreased when it was made in the pre-test.

2. Pre-testing did not appear to improve compensation--attending more carefully to the unfamiliar material.

3. ". . . the pre-test basically reduces the tension on the individual, reducing his motivation to learn." (223)

BORMUTH, JOHN R. "MEAN WORD DEPTH AS A PREDICTOR OF COMPREHENSION DIFFICULTY." CALIFORNIA JOURNAL OF EDUCATIONAL RESEARCH, 15 (1964), 226-231.

Purpose: The purpose of the study was

> . . . to test a new method of measuring the grammatical complexity of sentences to see if it could be used to predict the difficulty children have in comprehending written verbal materials. (226)

Principles, Concepts, or Procedures: The author tested three hypotheses.

> 1. Over a set of passages as a whole there is a correlation between mean word depth and comprehension difficulty.
>
> 2. There is a correlation between comprehension difficulty and mean word depth when the subject matters of the passages are held constant and the Dale-Chall readabilities are systematically varied. Further, this correlation is higher than a similarly obtained correlation between comprehension difficulty and the Dale-Chall predicted difficulties.
>
> 3. There is a correlation between mean word depth and comprehension difficulty when the Dale-Chall predicted difficulties of the passages are held constant, and the subject matters of the passages are varied. (227-228)
>
> The nine passages used in this study were equally divided among three subject matter areas--literature, science, and social studies. One passage in each subject matter area had a Dale-Chall readability level of 4.5, 5.5, and 6.5. (228)

For each passage a 50-item cloze test was constructed. The subjects were 150 children enrolled in Grades 4, 5, and 6 of a single school. The group's mean score on each cloze test was used as the measure of comprehension difficulty of the passages which were accordingly assigned ranks. "The depth of each word in each passage was determined. . . .

Ranks were assigned to the passages according to the relative sizes of the means of their word depths." (228)

Conclusions: The first hypothesis was found to be significant at the .05 level. The Spearman rho correlation was .77. The second hypothesis yielded a Kendall W correlation of .33 because of the perfect correlation between mean word depth and predicted difficulty. The third hypothesis yielded a Kendall W correlation of .78. Because this study demonstrated that mean word depth can predict differences in difficulty among passages differing on content, ". . . concept difficulty or idea density is, at least in part, no more than a tendency for authors to use different sentence structures when they write about different subject matters." (230)

BORMUTH, JOHN R. "COMPARABLE CLOZE AND MULTIPLE-CHOICE COMPREHENSION TEST SCORES." *JOURNAL OF READING*, 10, 291-299.

Purpose: The author reports a study designed to build a "frame of reference by which the size of the cloze score can be interpreted" (291) when used as a measure of the comprehension difficulties of a passage.

Principles, Concepts, or Procedures: Nine passages of approximately 275 words each were used and ranged in Dale-Chall readability from 4.5 to 6.5.

> A 50-item cloze test and a 31-item multiple-choice test were made over each of [the] nine passages. (293)
>
> The tests were administered under untimed conditions to 100 pupils enrolled in Grades 4 and 5. All the cloze tests were administered before any of the multiple-choice tests were given and before the subjects were permitted to read the passages from which the tests were made. Subjects were instructed to guess on all items where they did not know the correct answers. Approximately three days after a cloze test was administered, the multiple-choice test over the same passage was given. The subject first read the passage and then, without being allowed to refer to the passage, took the test over it. (293-294)

To determine if the multiple-choice scores were unusually inflated because of this procedure, a second study was run. Two new samples, consisting of 32 and 27 subjects from Grades 4 and 5, were drawn.

> . . . each group took one of the composite multiple-choice tests after taking a cloze test over it and another without a cloze test preceding it. The test conditions and instructions were the same as those used in the first part of the study. No effort was made to match the groups, since the tests were matched for difficulty. (294)

Conclusions:

> If the conventional readability standards are accepted, a passage on which a student receives a cloze score of 38 percent is sufficiently understandable to him to be used in his instruction. That is, he can correctly answer about 75 percent of the multiple-choice items that can be written over that passage. On the other hand, if one demands as a criterion a multiple-choice score corrected for guessing, a cloze test score of 43 percent is required to reach the same criterion level. (298)

The second study demonstrated that the multiple-choice scores had not been unusually inflated because of the design of the first study.

BORMUTH, JOHN R. "NEW MEASURES OF GRAMMATICAL COMPLEXITY." THE PSYCHOLINGUISTIC NATURE OF THE READING PROCESS. EDITED BY KENNETH S. GOODMAN. DETROIT: WAYNE STATE UNIVERSITY PRESS, 1968, 239-253.

Purpose: The purpose was

1. ". . . to investigate the sizes of the correlations between comprehension difficulty and . . ." (239) frequency, mean word depth, and length of independent clauses.

2. to discover ". . . if relationships between comprehension difficulty and measures of grammatical complexity change as a function of the reading ability of the subject." (239)

Principles, Concepts, or Procedures: The procedures reported here are the same as reported in "Experimental Applications of Cloze Tests."[1]

Conclusions:

1. There was a significant correlation between all three measures of grammatical complexity and comprehension difficulty.

2. Measures of mean word depth and length of independent clauses did not appear dependent on reading ability. However, independent clause frequency was slightly significant as reading achievements increased.

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[1] See page 8 of this thesis.

BORMUTH, JOHN R. "FACTOR VALIDITY OF CLOZE TESTS AS MEASURES OF READING COMPREHENSION ABILITY." READING RESEARCH QUARTERLY, 4 (1969), 358-365.

Purpose: The author reports a study designed to examine the factor validity of cloze tests as measures of comprehension.

Principles, Concepts, or Procedures: Nine passages of 250 words were chosen from various subject areas and ranged in Dale-Chall readability from 4.5 to 6.5. A fifty-item cloze test which utilized every-fifth-word deletions was constructed. Seven multiple-choice tests designed to measure vocabulary, facts, sequences, relationships, main ideas, inferences, and author's purpose were written and validated by judges.

Subjects were 150 fourth, fifth, and sixth grade students who were administered the cloze tests first. The subjects were later permitted to read the passage and then completed the multiple-choice tests. Only exact replacements were scored correct.

Conclusions: The correlations among cloze tests were high, as were most among all tests in the correlation matrix.

> It appears, . . . , that cloze tests made by deleting every fifth word measure skills closely related or identical to those measured by conventional multiple-choice comprehension tests. Little or no evidence was found to suggest that the two types of tests might measure different skills. (365)

BRADLEY, MICHAEL. "EFFECTS ON READING TESTS OF DELETIONS OF SELECTED GRAMMATICAL CATEGORIES." PAPER PRESENTED AT THE NATIONAL READING CONFERENCE, ATLANTA, GEORGIA, DECEMBER 4-6, 1969.

Purpose: An investigation was made of the effects of the removal of certain grammatical categories from standardized reading comprehension test paragraphs on the reading comprehension of 180 third, fourth, and fifth graders enrolled in a rural Georgia school system.

Principles, Concepts, or Procedures: Each grade level contained a high and low reading ability group, based on standardized reading test scores. The materials used were paragraphs and the accompanying multiple-choice items from various standardized reading tests appropriate for these grade levels. The paragraphs were altered by deletion of the following grammatical elements: (1) all nouns, (2) all adjectives, (3) all verbs, (4) all function words, (5) all words, and (6) no words.

Conclusions: The deletion of nouns had a significant effect at all three grade levels, but the deletion of adjectives had a significant effect only for fifth grade. It was also found that the subjects could answer the multiple-choice items without the aid of the accompanying reading paragraph at a level greater than chance. Therefore, it was concluded that the reading comprehension test was measuring other variables such as past learning and word association in addition to ability to take cues directly from the reading paragraph. Tables and references are included.[1]

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[1] Research in Education (Washington, D.C.: United States Government Printing Office, 1970), Vol. 5, No. 8, p. 88. (ED 038 242, 12 pages).

CARVER, RONALD P. "WHAT IS READING COMPREHENSION AND HOW SHOULD IT BE MEASURED?" PAPER PRESENTED AT THE NATIONAL READING CONFERENCE, ATLANTA, GEORGIA, DECEMBER 4-6, 1969.

Purpose: Four conceptually different variables in reading: (1) knowledge gained (new information), (2) amount comprehended (degree of understanding), (3) reading aptitude (differences between individuals), and (4) reading improvement (within individual changes as a result of treatment) are discussed.

Principles, Concepts, or Procedures: Existing measures of reading comprehension are evaluated in terms of their potential for measuring these variables. It was concluded that most commercially available reading comprehension tests and the exact scoring cloze technique were inadequate measures or indicants of knowledge gained, amount comprehended, or reading improvement and should be regarded and used as measures of reading aptitude only. The Tinker Speed of Reading Test was recommended as a measure of reading improvement and reading aptitude.

Conclusions: The Carver-Darby Chunked Reading Test which was designed and developed to measure the changes that take place as a result of reading was described and recommended as a standardized indicant of knowledge gained, amount comprehended, reading aptitude, and reading improvement. Tables and references are included.[1]

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[1] Research in Education (Washington, D.C.: United States Government Printing Office, 1970), Vol. 5, No. 8, p. 88. (ED 038 243, 15 pages).

CHARLES, EDWARD. "AN INVESTIGATION OF THE USE OF CLOZE TESTS TO COMPARE GAIN SCORES OF STUDENTS IN SCIENCE WHO HAVE USED INDIVIDUALIZED SCIENCE MATERIALS AND THOSE WHO HAVE USED TRADITIONAL TEXTBOOK MATERIALS." UNPUBLISHED ED.D. DISSERTATION, LEHIGH UNIVERSITY, 1970.

Purposes: The main purpose of this study was to determine if cloze tests are sensitive to gain measurement when an individualized approach and a traditional textbook approach to science instruction are used.

A secondary purpose of this study was to determine what relationships exist among the scores made by fifth grade children in both the experimental and control groups on standardized tests of reading and science ability and gain scores as measured by cloze test procedures.

Principles, Concepts, or Procedures: A sample of three hundred children, one hundred fifty girls and one hundred fifty boys, was randomly selected from a population of five hundred and twenty fifth grade students in Centennial School District, Warminster, Pennsylvania.

The following tests were administered: The Sequential Tests of Educational Progress, Reading, Level 4B and Science, Level 4B, were used to provide measures of reading and science achievement. The investigator constructed cloze tests from individualized science activities and science textbooks.

The instructional program covered three weeks which included one hundred sixty minutes of science instruction per week for both groups. Control group teachers taught traditionally using a basal science textbook. Experimental group teachers used individualized science activities developed by a Bethlehem Area School District ESEA Title III program, Keys for Interdisciplinary Tutorial Study.

The differences between gain scores made by pupils taught by the individualized method and those made by pupils taught by the traditional method were determined by a two factor analysis of variance. The relationships among general reading ability, science ability and gain scores on cloze tests were determined by the Pearson Product Moment coefficient of correlation.

Conclusions: Analysis of the data showed the following:

1. The gain scores of the experimental group were significantly higher than the gain scores of the control group on the cloze tests constructed from individualized science materials with $P. < .001$.

2. The gain scores of the control group were significantly higher than the gain scores of the experimental group on the cloze tests constructed from the science textbook materials with $P. < .01$.

3. Gain scores made by girls in both the experimental and control groups were significantly higher than gain scores made by boys in both groups on the cloze tests constructed from individualized science materials with $P. < .01$.

4. There were no significant differences in the gain scores made by girls and boys in the experimental and control goups on the cloze tests constructed from science textbook materials with $P. > .05$.

5. With the experimental group, the highest relationships were found between the post-cloze test constructed from individualized science materials and STEP Reading. The relationships between gain scores and all other variables were at best only moderately high.

6. With the control group, the highest relationships were found among the pre-cloze test constructed from science textbook materials, STEP Reading, and the post-cloze test constructed from individualized science materials. The relationships between gain scores and all other variables were at best only moderately high.

The following conclusions were drawn on the basis of the analysis of the data.

1. Cloze test instruments are sensitive to gain measurement.

2. The individualized approach to science instruction is not superior to the traditional science textbook approach in terms of cloze test gain scores after a three week period.

3. Fifth grade girls scored significantly higher than fifth grade boys on the cloze test constructed from individid-

ualized science materials probably because of superior reading ability.

4. Fifth grade boys will do as well as fifth grade girls in science provided the materials they are expected to read are suitable for them in terms of their level of reading achievement.

5. Cloze test results are valid measures of reading comprehension ability.[1]

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[1] Dissertation Abstracts International A: The Humanities and Social Sciences (Ann Arbor, Michigan: University Microfilms, 1971), Vol. 31, No. 10, p. 5026-A. (Order No. 71-10,501, 89 pages).

COLEMAN, E. B. "IMPROVING COMPREHENSIBILITY BY SHORTENING SENTENCES." JOURNAL OF APPLIED PSYCHOLOGY, 46 (1962), 131-134.

Purpose: The effect of shortening sentences on comprehensibility was investigated.

Principles, Concepts, or Procedures: Three ten-sentence passages were chosen from The Human Species by Geldard for rewriting into two versions containing six and fifteen sentences.

Subjects were ninety college undergraduates who were divided into five groups. Since every-fifth-word deletions were used, every word became a test item. Subjects were given fifty seconds to read each passage before completing it. Only exact replacements were scored correct.

Conclusions: The shorter sentences were more comprehensible than the longer ones, but the magnitude of improvement was small. Four hypotheses are suggested by the author for further study.

COLEMAN, E. B., AND MILLER, G. R. "A MEASURE OF INFORMATION GAINED DURING PROSE LEARNING." READING RESEARCH QUARTERLY, 3 (1968), 369-386.

Purpose: The authors describe two experiments designed to measure the degree to which a passage transmits new information.

Experiment I

Principles, Concepts, or Procedures: Twenty college undergraduates were matched with the subjects who had been administered five forms of a cloze test in a previous study. Since the subjects in the previous study had not been allowed to read the material before taking the cloze test, the subjects in this study were allowed to read the material before testing in order to compare the two scores to determine the amount of information gain.

Materials and procedures were identical in both studies, except that in the second each subject was administered only 18 instead of 36 passages. Sixty seconds were allowed for study and six minutes for completion of each passage.

Conclusions: Because of the high correlation of .93 between the two scores, it appears that the cloze score before reading is measuring essentially the same information as the cloze score after reading.

Experiment II

Principles, Concepts, or Procedures: The materials used were identical to those in Experiment I. Subjects were nine college undergraduates who were tested as a single group. By means of transparencies and an overhead projector, the experimenter revealed one word at a time after the subjects had written their prediction. Because the procedure was repeated, the difference in correct words was assumed to be a measure of information gained.

Conclusions: The mean gain per hundred words was 38.93, and the "before" and "after" correlation was .57. This procedure appears to be an accurate measure of information gain. Passages containing few abstract nouns, few verb-nominalizations, few kernels, and many short words transmitted maximum information gain.

CRANNEY, ADELBERT GARR, JR. "A COMPARISON OF A FREE-RESPONSE AND MULTIPLE-CHOICE CLOZE READING TEST." UNPUBLISHED PH.D. DISSERTATION, UNIVERSITY OF MINNESOTA, 1968.

Purposes: The cloze procedure consists of the presentation of a reading passage with deleted words. The reader is required to supply the missing words from the remaining context. This procedure has recently been applied to the measurement of reading comprehension.

Traditional reading tests are difficult to construct and tend to divert the attention of the reader to comprehension questions rather than to the reading of the passage itself. Cloze tests in both respects seem to offer an improved method of measuring reading comprehension.

The purpose of the study was to compare two types of cloze reading tests with respect to validity and reliability. A second purpose of the study was to investigate the effects on reliability and validity of eliminating ineffective items from the two cloze tests.

Principles, Concepts, or Procedures: Two, 300 item cloze tests were constructed. The first was an every 10th deletion, cloze test based on six college textbook passages. The second test was based on the same material but was multiple-choice in form. Distractors for the correct responses on this test were generally synonyms. On the basis of item analysis techniques, 165 ineffective items were eliminated from each test providing a long and short form of each test. Two groups of 100 college sophomores were administered the long and short forms of one of these tests and also the Cooperative Reading Test. Item selection was based on two other groups of 400 students each.

Comparisons among the several test forms were based on reliability coefficients and validity correlations of cloze scores with Cooperative Reading Test comprehension scores. Tests of significance employed the t, F, or z statistics and the .01 level of confidence.

1. Reliability coefficients on all test forms ranged from .83 to .93 and validity coefficients with the Cooperative Reading Test comprehension scores ranged from .51 to .54.

2. The comparison of the free-response and multiple-choice test forms resulted in no significant differences in reliability. One significant validity difference was found

in favor of the multiple-choice form. This form also contained about 30% more difficult items and was the better test in respect to the distribution and range of item correlations with total cloze test scores.

3. The shortening of each long test significantly decreased the reliabilities of each of the shorter forms but did not significantly change validity coefficients with the _Cooperative Reading Test_ comprehension scores.

4. Comparison between the short forms of the two tests resulted in a significant validity difference in favor of the multiple-choice test form, but no significant differences between the reliabilities of the two forms.

Conclusions:

1. It was concluded that all cloze test forms were valid measures of reading comprehension having about 26% of common variance with the _Cooperative Reading Test_.

2. All test forms were also considered reliable measures of reading comprehension for group comparisons but not adequate for individual comparisons.

3. Item analysis and selection procedures used in this study do not improve validity coefficients of either test.

4. The two cloze tests constructed in this study tested different abilities and are, therefore, not comparable.[1]

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[1] _Dissertation Abstracts A: The Humanities and Social Sciences_ (Ann Arbor, Michigan: University Microfilms, 1968), Vol. 29, No. 3, p. 811-A. (Order No. 68-12,251, 169 pages).

CRAWFORD, ALAN NEAL. "THE CLOZE PROCEDURE AS A MEASURE OF THE READING COMPREHENSION OF ELEMENTARY LEVEL MEXICAN-AMERICAN AND ANGLO-AMERICAN CHILDREN." UNPUBLISHED ED.D. DISSERTATION, UNIVERSITY OF CALIFORNIA, LOS ANGELES, 1970.

Purpose: The purpose of this study was to investigate the validity, reliability, and appropriateness of cloze tests as a measure of the reading comprehension of third and sixth grade Mexican-American and Anglo-American children.

The three hypotheses and two related questions involved four basic problems: (1) the correlations between cloze test scores and scores on standardized reading tests and oral reading tests for groups at each grade level; (2) the differences among cloze test scores for groups at each grade level; (3) the reliability coefficients of cloze test scores for groups at each grade level; and (4) the degree of correspondence between instructional reading levels determined by cloze tests and by standardized reading tests, oral reading tests, and teacher judgment, for groups at each grade level.

Principles, Concepts, or Procedures: The randomly selected population of 180 subjects consisted of third and sixth grade Mexican-American and Anglo-American children whose dominant home language was English, and Mexican-American children whose dominant home language was Spanish. Each of the resulting groups, which were designated MAE, MAS, and AE at each grade level, consisted of 30 subjects. On the basis of standardized reading test scores, the subjects at each grade level were classified as more able or less able readers.

The reading subtests of the Stanford Achievement Test, Primary II, Form Y, and a cloze test at the second grade level were administered to all third grade subjects. The reading subtests of the Comprehensive Tests of Basic Skills, Level 2, Form Q, and a cloze test at the fourth grade level were administered to all sixth grade subjects. The Gilmore Oral Reading Test, Form C, was administered to selected subjects in each group at both grade levels. Additional cloze tests at other grade levels from first to seventh were administered to all subjects in order to determine their instructional reading levels.

Conclusions: Correlations between scores on cloze tests and on standardized reading tests and oral reading tests were significant for MAE, MAS, and AE subjects at the third and sixth grade levels. Correlations were significant for groups classified as more able or less able except where low variability was produced by the restriction on the range of scores. A significant difference among cloze test scores of the MAE, MAS, and AE groups at the third grade level did not appear at the sixth grade level. The reliability coefficients of all groups except the sixth grade MAE group were above .70. Reliability coefficients for groups classified as more able and less able and for the sixth grade MAE group were affected by low variability produced by the restriction on the range of scores; results were therefore inconclusive. Instructional reading levels determined by cloze tests corresponded closely with those determined by the other measures.

It was concluded that cloze tests were a valid and reliable means of testing reading comprehension and determining instructional reading level for these third and sixth grade Mexican-American and Anglo-American children.[1]

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[1] Dissertation Abstracts International A: The Humanities and Social Sciences (Ann Arbor, Michigan: University Microfilms, 1971), Vol. 31, No. 7, p. 3162-A. (Order No. 71-610, 99 pages).

DARNELL, DONALD K. "THE RELATION BETWEEN SENTENCE ORDER AND COMPREHENSION." SPEECH MONOGRAPHS, 30 (1963), 97-100.

Purpose: This study investigated the relationship between the accuracy of predictions about the missing parts of a message and the order of the sentences within the message.

Principles, Concepts, or Procedures: The experimental message comprised fifteen sentences--a thesis, two major contentions, two subcontentions for each, and two assertions for each subcontention. These sentences were systematically rearranged into six other orders.

The seven resulting forms--ranging from "correct order" to "most mixed"--together with a control message were administered to 140 college undergraduates. Each form was administered to twenty subjects. Time limits were imposed. The cloze deletion system is not described.

Conclusions: While disorder did affect comprehension in this study, this finding is not generalizable. While showing that loss of clarity becomes greater as disorganization increases, the author cites several related areas requiring research.

DAUGHERTY, JOAN. "THE EFFECT OF THE CLOZE PROCEDURE AND INTERSPERSED QUESTIONS AS AN AID TO READING COMPREHENSION." UNPUBLISHED PH.D. DISSERTATION, THE UNIVERSITY OF AKRON, 1971.

Purpose: The purpose of this study was: (1) to compare different modes of presentation of reading material and evaluate their effects on reading comprehension as measured by retention on a multiple-choice test; (2) to ascertain if different presentations of reading material produce different results in retention of Knowledge-, Comparehension-, and Application-type questions as defined in Bloom's Taxonomy of Educational Objectives; (3) to substantiate previous research findings that the placement of questions does facilitate learning.

Principles, Concepts, or Procedures: The subjects were 197 fourth grade pupils whose mean IQ score was within the normal range of intelligence (90-110) as measured by the California Test of Mental Maturity. The sample was limited to those schools located in geographical areas defined as white, middle-class socio-economic districts.

The six treatment groups were as follows:

1. Knowledge-type questions were interspersed in the reading passage after each paragraph. The subjects were required to answer each question mentally.
2. Comprehension-type questions were interspersed in the reading passage after each paragraph. The subjects were required to answer each question mentally.
3. The cloze procedure using a pattern of deletion of 10 per cent of the noun determiners on each page of the reading passage required the subjects to replace the deletions.
4. The cloze procedure using a pattern of deletion of every tenth word in the reading passage required the subjects to replace the deletions.
5. An irrelevant reading passage was included to establish a baseline of learning.
6. The reading passage of the control group had neither deletions nor interspersed questions.

The reading material was in booklet form with the multiple-choice test at the end of the booklets. The data collected was analyzed statistically by analysis of variance.

Conclusions: The results indicated there was no significant difference between the mean score of the experimental treatment groups and the control group on the twenty-item multiple-choice test. On the subtests which consisted of eight Knowledge, seven Comprehension, and five Application questions, no significant difference existed.

It was concluded that with the sample used in this study, neither interspersed questions nor word deletions aided comprehension. However, additional research should be conducted before definite decisions are made on which mode of presentation of reading material is most effective in insuring that the maximum level of comprehension is reached.[1]

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[1] Dissertation Abstracts International A: The Humanities and Social Sciences (Ann Arbor, Michigan: University Microfilms, 1971), Vol. 32, No. 2, p. 664-A. (Order No. 71-20,275, 82 pages).

FELDMAN, MARGARET EICHBAUER. "THE EFFECTS OF LEARNING BY PROGRAMED AND TEXT FORMAT AT THREE LEVELS OF DIFFICULTY." UNPUBLISHED PH.D. DISSERTATION, CORNELL UNIVERSITY, 1964.[1]

Purposes: The present study was designed to investigate two aspects of the stimulus characteristics of learning materials: first, programed or text format; and second, differing difficulty levels of the reading materials. One characteristic of the learner, namely his verbal ability, and the interactions among all three of these variables were also investigated.

Principles, Concepts, or Procedures: Three versions of a beginning psychology program were prepared by increasing the reading difficulty level from the original "standard - fairly difficult" level to one of "difficult" and another of "very difficult" reading level. Using these materials as a base, three text versions were prepared, one for each of the three difficulty levels, by filling in the blanks and organizing the materials into paragraphs. Half of a sample of 144 college students had been selected for high verbal ability and half for low. Half of each of these groups took one or the other of the three difficulty levels of program and the other half took one of the three levels of text material. Tests of learning were by means of cloze tests which used material identical to that being learned, and transfer tests which asked students to transfer their learning to new problems.

Conclusions: Using a cloze test measure of gains, no significant differences were found between learning by program or text. Using a transfer measure of learning, a significant difference was found in favor of text for low verbal ability subjects, with a trend in the same direction for high ability subjects. These findings lend support to the conclusion that format is not a critical determiner of learning with material similar to that being tested but that the larger "wholes" of the text appear to provide better transfer than the "parts," as represented by the program items. It may be hypothesized that programed format destroys organizational patterns of the learner by the constant interruption by calls for response and may lead to premature clozure.

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[1] See also Margaret E. Feldman, "Learning by Programmed and Text Format at Three Levels of Difficulty," Appendix.

No significant differences in learning were found attributable to the three difficulty levels of the learning materials, although the materials were perceived subjectively by the subjects to conform to the expected difficulty levels. It may be that other values of the try-out procedure used to create programs, such as better organization and more repetitions, may be more critical for learning than the readability level.

No significant differences were found between high and low verbal ability groups on gains as measured by the cloze test, but a significant difference was found in favor of the high ability group on the transfer test.

A significant interaction was found between verbal ability and difficulty level of the material on the cloze test measure of gains. Subjects made more gains when the material was at a level of challenge but still not too difficult. No other interactions were found to be significant.

Perhaps the significant contribution of programed learning will be an understanding of how to write textbooks which will communicate well and still offer the possibilities for organization by the student as provided by a text.[1]

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[1] Dissertation Abstracts (Ann Arbor, Michigan: University Microfilms, 1964), Vol. 25, No. 3, p. 1738. (Order No. 64-8105, 125 pages).

FLETCHER, JUNIOR EUGENE. "A STUDY OF THE RELATIONSHIPS BETWEEN ABILITY TO USE CONTEXT AS AN AID IN READING AND OTHER VERBAL ABILITIES." UNPUBLISHED PH.D. DISSERTATION, UNIVERSITY OF WASHINGTON, 1959.

Purpose: For the mature reader, the general context, total word form, and detailed word parts all function in word recognition. While the role of total word form and detailed word parts in the recognition of printed symbols had been rather thoroughly studied, the importance of the contribution made by context to the whole perceptual process of reading had not been as systematically investigated. It was the purpose of this study, therefore, to gather data of a quantitative nature which would give more specific information as to the importance of the role played by ability to use context in word recognition.

Principles, Concepts, or Procedures: To do this, the ability to use context of 174 University of Washington freshmen was measured using an adaptation of Taylor's "cloze" procedure. A test was devised using three reading selections, each approximately 250 words in length, in which every fifth word was replaced by a blank. The subjects were instructed to fill in the blanks with the words they thought belonged there on the basis of the surrounding verbal context. Scores were given on the basis of the number of blanks filled with words which matched those used by the author of the selection.

Reading abilities were measured with the Cooperative English Test, Reading Comprehension and the Rate of Comprehension Test, Dvorak-Van Wagenen Examination of Silent Reading Abilities. These provided scores for reading vocabulary, level of comprehension, and two rate of comprehension scores. In addition, the American Council on Education Examination of College Freshmen (ACE) was used to measure general verbal ability.

Conclusions: When test results were correlated, substantial relationships were disclosed between ability to use context as measured by the "cloze" procedure test and all of the tests of reading abilities and also the test of general verbal ability. The two tests designed to measure speed of comprehension, the Dvorak-Van Wagenen Rate of Comprehension Test and the Cooperative English Test, Speed of Comprehension, showed practically the same correlations with the "cloze" procedure test, .590 and .570, respectively, while their intercorrelation was

.560. The Cooperative English Test, Level of Comprehension showed a correlation of .547 with the "cloze" procedure test while the Cooperative English Test, Vocabulary gave a correlation of .630. The highest correlation, .718, was between the ACE, Linguistic Section and the "Cloze" procedure test.

A study was made of the characteristics of the "cloze" procedure test, particularly to determine its reliability. Reliabilities calculated using both the Kuder-Richardson Formula 20 and a split-half technique were the same, .87, which also indicated a highly homogeneous test. An examination of the test items indicated a good spread of difficulty level and showed that almost all of them discriminated positively between low and high scorers on the test.

The substantial relationships between general ability to use context and reading abilities, as shown in this study, lent support to the conclusion that ability to use context as an aid in reading is a significant underlying factor in the reading proficiency of the mature reader.

It was recommended that the effects of variations in make-up, content, and method of administration of "cloze" procedure materials be further investigated; that studies be made at lower grade levels to gather information about the growth of ability to use context; and that similar studies using "cloze" materials and reading tests containing material closely comparable as to level of difficulty, type, and subject matter content be carried out.[1]

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[1] Dissertation Abstracts (Ann Arbor, Michigan: University Microfilms, 1960), Vol. 20, No. 7, pp. 2675-2676. (L. C. Card No. Mic 59-5483. 104 pages).

GEYER, JAMES RUSH. "THE CLOZE PROCEDURE AS A PREDICTOR OF COMPREHENSION IN SECONDARY SOCIAL STUDIES MATERIAL." UNPUBLISHED ED.D. DISSERTATION, UNIVERSITY OF MARYLAND, 1970.[1]

Purpose: The major purpose of this study was to investigate the effectiveness of the cloze procedure as a predictor of students' abilities to comprehend social studies materials. A secondary investigation dealt with the effectiveness of utilizing social studies materials written on lower readability levels to improve comprehensibility.

Principles, Concepts, or Procedures: The following hypotheses were investigated:

A. Cloze Procedure

1. Cloze test scores predict students' abilities to comprehend social studies materials better than do standardized reading test scores.
2. Cloze test scores predict students' abilities to comprehend social studies materials better than do I.Q. scores.
3. Cloze test scores predict students' abilities to comprehend social studies materials better than do previous social studies grades.

B. Rewritten Materials

Students achieve higher scores on the criterion measure, a multiple-choice test, when reading social studies materials written on a low readability level than when reading social studies materials written on a more difficult level.

Instructional materials utilized in this study were two junior high school American history texts. Both texts contained identical topics and visual aids; however, readability levels rated by the Dale-Chall readability formula were different.

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[1] See also James R. Geyer, "Cloze Procedure as a Predictor of Comprehension in Secondary Social Studies Materials," Appendix.

The data consisted of scores from the pre-reading cloze tests, an I.Q. test, previous social studies grades, a standardized reading test, and the criterion measure, a multiple-choice test. The subjects were 201 eighth-grade students from a junior high school population. All subjects completed one of two cloze test forms. Then they read the chapter in the text from which the cloze test had been developed and completed the multiple-choice test. Significant differences at the .01 level between two correlation coefficients involving a common variable were investigated in reference to the cloze hypotheses. An analysis of covariance was applied to ascertain the effectiveness of rewritten social studies materials on lower readability levels as a means of improving comprehensibility of that material.

Conclusions: The following conclusions were drawn from the findings.

1. The research hypothesis that cloze test scores predict students' abilities to comprehend social studies materials better than do standardized reading test scores was not supported by the data.
2. The research hypothesis that cloze test scores predict students' abilities to comprehend social studies materials better than do I.Q. scores was not supported by the data.
3. The research hypothesis that cloze test scores predict students' abilities to comprehend social studies materials better than do previous social studies grades was not supported by the data.
4. The research hypothesis that students achieve higher scores on the criterion measure, a multiple-choice test, when reading social studies materials written on a low readability level than when reading social studies material written on a more difficult level was not supported by the data.

The following recommendation for practice is suggested by the data from the study: Care should be taken to ascertain that published materials which are rewritten on lower readability levels are more readable for the intended student. The data of the study suggest that application of readability formulas may not predict the ability of students to comprehend the materials adequately.

Several implications for research are suggested by the data. First, although the cloze procedure was not found to be the best predictor of ability to comprehend specific instructional material, it was correlated highly enough with the criterion measure to warrant further investigation. The rationale for the preceding statement lies in the significant differences at the .05 level for hypotheses two and three. Secondly, a further investigation of the effectiveness of combinations of independent variables as criteria for predicting academic success in content areas appears to be warranted. Such an investigation is especially relevant because of evidence that quantitative evaluation of instructional material may not give a true picture of readability.

The theory which is the basis for most readability formulas involves objective, quantitative assessment of passages. Implications for theory include continued investigation of certain qualitative factors. Assessment of such qualitative factors as concept load, abstractness, and organization, especially through interaction involving the reader and instructional material, is recommended.[1]

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[1] Dissertation Abstracts International A: The Humanities and Social Sciences (Ann Arbor, Michigan: University Microfilms, 1970), Vol. 31, No. 5, p. 2002-A. (Order No. 70-22, 549, 152 pages).

GREENE, FRANK PIERREPONT. "A MODIFIED CLOZE PROCEDURE FOR ASSESSING ADULT READING COMPREHENSION." UNPUBLISHED PH.D. DISSERTATION, THE UNIVERSITY OF MICHIGAN, 1964.[1]

Purpose: This study reports 1) an investigation of the effect on concurrent validity of modifying the standard cloze procedure and 2) an attempt to demonstrate two components of reading comprehension as measured by the cloze technique.

Principles, Concepts, or Procedures: The cloze procedure consists of deleting every *n*th word from a reading passage. The deleted words are replaced by numbered blanks, and the reader is asked to fill in the words missing from the passage. The percentage of words to be deleted is set and restrictions as to the class(es) of words eligible for deletion may be set. The deletion process is automatic: within the chosen deletion rate and eligible words, every *n*th word is removed.

The standard procedure used was the automatic deletion of every 12th word with no word class restrictions. The modified cloze procedure restricted eligible words to nouns, verbs, adverbs, and adjectives (content words) and each potential deletion was evaluated for possible effectiveness. For each word deleted under the modified procedure, there was felt to be sufficient redundancy remaining in the passage so that a superior reader could make positive identification of the missing word.

All testing was completed in one regularly scheduled class period. The subjects (N = 128) were all regularly enrolled in the University of Michigan and were divided in the proportions, 80% female/ 20% male and 56% undergraduate/ 44% graduate students.

Conclusions: The following findings were reported: 1) No significant differences were found between the coefficients of the two cloze procedures and two standardized reading tests. All coefficients were significant.

2) Two cloze tests constructed by the standard procedure but starting with different words did not differ in mean score or standard deviation.

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[1] See also Frank P. Greene, "Modification of the Cloze Procedure and Changes in Reading Test Performances," Appendix.

3) Item discrimination indices (r) demonstrated that the modified cloze procedure produced items of higher "quality." Item difficulty indices (p) showed that the modified procedure eliminated items of extreme difficulty or ease.

4) The cloze scores were not significantly raised by reading the original passage prior to taking the cloze test as contrasted with taking the cloze test without prior reading.

5) Reading rate was found to be correlated at a low, but significant level with the performances on the cloze tests.

6) Multiple correlation coefficients of the cloze tests results with the power and context vocabulary tests, while significant, accounted for only about one third of the cloze test variance.

It was concluded that 1) the modified cloze procedure does not improve the effectiveness of the standard cloze procedure as a measure of adult reading comprehension, and 2) the two vocabulary tests (power and context) do not, by themselves, account for the variance of the cloze measure of reading comprehension.[1]

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[1] Dissertation Abstracts (Ann Arbor, Michigan: University Microfilms, 1965), Vol. 25, No. 10, p. 5734. (Order No. 65-5308, 130 pages).

GUTHRIE, JOHN T. "MOTIVATIONAL EFFECTS OF FEEDBACK IN READING." BALTIMORE, MARYLAND: CENTER FOR THE STUDY OF SOCIAL ORGANIZATION OF SCHOOLS, JOHNS HOPKINS UNIVERSITY, 1971.

Purpose: The effects of feedback on motivation were investigated with a 3 x 3 factorial design.

Principles, Concepts, or Procedures: Adult subjects (72 male college students) read prose sentences and completed cloze test items. Feedback on each item was either immediate, delayed, or omitted. A cloze retention test over the sentences was given either immediately, delayed, or was omitted. To assess motivation, the subjects were given a continuation of the original passage which they read for as long as they wished. The time spent reading was recorded as a measure of perseverance and motivation.

Conclusions: The results indicated that (1) delayed feedback produced significantly more learning on the original task than did immediate feedback, (2) immediate feedback produced significantly more perseverance on the continuation passage than did delayed feedback, and (3) perseverance on the continuation passage was positively correlated (.46) with scores on a comprehension test over the continuation passage. The results are explained in terms of differential affective responses acquired to the reading task under different feedback conditions. Tables, references, and appendixes are included.[1]

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[1] Research in Education (Washington, D.C.: United States Government Printing Office, 1971), Vol. 6, No. 1, p. 75. (ED 042 590, 35 pages).

HAFNER, LAWRENCE E.; GWALTNEY, WAYNE; AND ROBINSON, RICHARD. "READING IN BOOKKEEPING: PREDICTIONS AND PERFORMANCE." JOURNAL OF READING, 14 (1971), 537-546.

Purpose: The study was undertaken to determine the relationships between intelligence, reading, and teachers' ratings of students' characteristics.

Principles, Concepts, or Procedures: Subjects were 45 male and female high school students enrolled in bookkeeping classes. Three cloze tests were administered to all subjects. One utilized every-fifth-word deletions in randomly selected passages from one of students' texts. Another utilized every-fifth-noun or verb deletions in randomly selected passages of the same text. The third again used the same text but required subjects to replace deleted punctuation marks.

Teachers rated the subjects on the following variables: intelligence, achievement motivation, reading ability, and understanding of bookkeeping content in the text. Results from previously administered intelligence and achievement tests were also used.

Conclusions: Among the conclusions were that significant relationships existed between reading-cloze and measures of intelligence and achievement.

HATER, SISTER MARY ANN. "THE CLOZE PROCEDURE AS A MEASURE OF THE READING COMPREHENSIBILITY AND DIFFICULTY OF MATHEMATICAL ENGLISH." UNPUBLISHED PH.D. DISSERTATION, PURDUE UNIVERSITY, 1969.[1]

Purpose: The cloze procedure has been used by researchers as a measure of readability. Cloze tests are constructed by deleting words or symbols from passages and replacing them with blanks. The subject attempts to complete the passages. His score for each passage is the number of responses which match the deleted material.

Although the cloze procedure has been validated as a measure of comprehensibility and difficulty for English passages, cloze tests cannot be used indiscriminately to measure these constructs without considering the content area of the passages.

In this research, the cloze procedure was applied to mathematical English. Because of the concentrated symbolism and other factors which differentiate mathematical English from ordinary English, the cloze procedure was adapted to be used in this content area. In particular, the reliability and validity of the cloze procedure as a measure of the reading comprehensibility and difficulty of mathematical English passages were studied. Reliability was measured by the K-R formula 20 and by rankings of means. The validity of the cloze procedure as a measure of reading comprehensibility was assessed by correlating scores on cloze tests with scores on comprehension tests written over the same passages. The validity of the cloze procedure as a measure of reading difficulty was assessed by correlating the means on cloze tests with the means on comprehension tests written over the same passages.

Principles, Concepts, or Procedures: Five mathematical English passages, five comprehension tests on the passages, and twenty-five cloze tests, five for each passage, were the basic material administered to 1,717 subjects of Grades 7 through 10.

Conclusions: Results of this study supported the hypothesis that cloze tests over mathematical English passages are highly reliable measures for large or small groups, and across Grades 7 through 10 or within each grade. Cloze tests over mathematical English passages are valid predictors of the reading comprehensibility of mathematical English passages for the grades tested. An average linear correlation of 0.69 (using a z transformation) was found to represent the relationship between cloze test and comprehension test scores. This correlation may underestimate the relationship between cloze tests and comprehension tests since a quadratic model accounts for more variance than a linear model. However, the additional variance may be due to artifacts of guessing and subjects' distributions on comprehension tests.

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[1] See also Mary Ann Hater and Robert B. Kane, "The Cloze Procedure as a Measure of the Reading Comprehensibility and Difficulty of Mathematical English," Appendix.

Double cross-validation techniques within the same population were used to arrive at these conclusions. Not only were the correlations between cloze tests and comprehension tests high, but correlations were also similar for the different samples tested over the same passages and for samples tested over different passages. Therefore, conclusions concerning the use of cloze tests as predictors of comprehensibility were strengthened.

Cloze test means over mathematical English passages were ranked the same by different samples from the same population and were related highly for samples from different grade levels. Thus, it was concluded that the ranking of cloze tests is a reliable measure.

Since the number of mathematical English passages used in this study was only five, conclusions concerning the validity of cloze tests as measures of reading difficulty are tentative. Cloze test means were ranked the same as comprehension test means for four of the five passages. The difference in the ranking for the fifth passage alone caused correlations to be lower than desired. Consequently, there is enough evidence to suggest the probable conclusion that cloze tests are valid predictors of reading difficulty for mathematical English passages.[1]

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[1] Dissertation Abstracts International A: The Humanities and Social Sciences (Ann Arbor, Michigan: University Microfilms, 1970), Vol. 30, No. 11, p. 4829-A. (Order No. 70-8900, 334 pages).

HENRY, PEGGY ELAINE. "THE EFFECT OF INTEREST ON READING COMPREHENSION AS MEASURED BY CLOZE AND MULTIPLE CHOICE TESTS." UNPUBLISHED PH.D. DISSERTATION, THE UNIVERSITY OF IOWA, 1969.

Purpose: The central problem studied in this investigation was how interest affected reading comprehension. There were two measures of reading comprehension and two separate designs employed to study this question.

Part I

Principles, Concepts, or Procedures: Part I of the study included 80 matched pairs of boys and 82 matched pairs of girls who were tested in reading comprehension by means of traditional multiple choice tests. First, each child took a pretest over a selection he had not yet read. Seven days later he read the selection and took a post-test over the content contained in it. Two selections, comparable in readability, were involved in this design, one about a topic that appealed to boys and one about a topic that appealed to girls. The two members of each pair read and took tests over different selections.

Conclusions: Comparisons were made between boys and girls on the same selection and between groups of the same sex on different selections. The differences between the mean scores of these four groups were tested simultaneously with analysis of covariance, then the adjusted means of the various groups, two at a time, were tested for significance with t-tests.

The following differences between the adjusted mean scores were significant at the .05 level of confidence: 1. The mean score of the girls was higher than the mean score of the boys on the test over the selection that was appealing to the girls. 2. The mean score of the boys was higher than the mean score of the girls on the test over the selection that was appealing to the boys. 3. The mean score of the girls on the test over the selection that was appealing to the girls was higher than the mean score of the girls on the test over the selection that was appealing to the boys.

It was concluded that reading comprehension as measured by the multiple choice tests in this study appeared to be positively and significantly affected by the readers' interest in the selection over which the tests were constructed.

Part II

Principles, Concepts, or Procedures: Part II of the study was conducted with fourth and sixth graders who took two sets of cloze tests over two selections comparable in readability. Both sets of selections consisted of pairs, one about a topic that would appeal to boys and the other about a topic that would appeal to girls. After taking each set of cloze tests, the subjects indicated a preference for one of the selections in the set. One hundred thirty-six subjects took the first set of cloze tests and 149 took the second set.

Conclusions: Comparisons were made between the two preference groups for each of the four cloze tests. That is, the subjects preferring one selection and the subjects preferring the other selection were compared on the same selection.

Analysis of covariance with ITBS reading comprehension scores as the covariate was the statistical design used to analyze the data. This served to equate the preference groups on reading ability so that initial differences in reading ability were not reflected in the subjects' cloze test scores. The tests for each of the four preference groups indicated that there were no significant differences between any two adjusted means. The conclusion drawn was that for these subjects, over these two sets of selections, preference for a selection did not appear to affect how it was comprehended when comprehension was measured by cloze tests.[1]

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[1] Dissertation Abstracts International A: The Humanities and Social Sciences (Ann Arbor, Michigan: University Microfilms, 1970), Vol. 30, No. 9, pp. 3857-A-3858-A. (Order No. 70-4369, 171 pages).

KNIGHT, DAVID W. "THE READING PERFORMANCE OF STUDENTS WITH NINTH GRADE READING ACHIEVEMENT ON OCCUPATIONAL INFORMATION MATERIALS WRITTEN WITH VARIOUS LEVELS OF READABILITY." UNPUBLISHED PH.D. DISSERTATION, THE FLORIDA STATE UNIVERSITY, 1966.

Purpose: The purpose of this study was to investigate the ability of students whose reading achievement on the Metropolitan Achievement Test is at the 9th grade level, to comprehend occupational information materials written at the 9th, 12th, and 15th grade levels as determined by the Flesch Readability Formula.

Principles, Concepts, or Procedures: The study was designed to make a comparison between 9th grade reading achievement and reading passages of occupational information written at three levels of readability. A treatment X subjects design was used. The treatments were one 50 item cloze test at each level of readability. The subjects were 150 students whose score on the reading section of the Florida State-Wide Ninth-Grade Testing Program was ± .5 S.D. of the mean for all students included in the Florida based norms.

The Flesch Readability Formula was used to analyze occupational information briefs randomly selected from the S.R.A. Occupational Information Kit. Each level of readability was represented by a 300 word passage. Cloze tests were made over each passage. A cloze test score for each passage was derived by averaging the percentage of words correctly restored to its cloze test forms. This passage cloze score became the basic cloze measure for the analyses. Three tests, one for each level of difficulty, were bound into a booklet with a cover sheet of instructions. The tests within the booklet were placed in random order. Only when a subject wrote in the blank the exact word deleted, was his response counted correct.

Conclusions: An analysis of variance with repeated measures and a multiple analysis t-test were used to analyze the data. Significant differences at the .05 level were indicated in the subjects performance on levels 9 and 15, also on levels 12 and 15. No significant differences were found in the subjects performance on levels 9 and 12 at the .05 level.

The rate of comprehension of occupational information materials decreased as the readability of these materials decreased.

The Flesch Readability Formula ranked the reading passages in the same order of readability as that indicated by the performance of the subjects on the cloze tests.

The occupational information materials rated at the 9th and 12th grade levels by the Flesch formula appear to be written at the instructional level (75% to 90% comprehension) for subjects with 9th grade reading achievement.

Occupational information materials rated at the 15th grade level by the Flesch formula approached the frustrational level (less than 75% comprehension) for subjects with 9th grade reading achievement.

None of the occupational information used in this study appears to be written at the independent level (90% comprehension) for subjects with 9th grade reading achievement.

The degree of comprehension of occupational information by 9th grade reading achievement is determined by the readability level at which these materials are written.

The Flesch Readability Formula may be used to estimate the readability of occupational information if the obtained estimates are interpreted in broad limits or multiple grade level categories rather than as indicators of specific grade levels.

Occupational information which is rated at the 9th grade level cannot be easily understood by students with 9th grade reading achievement.[1]

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[1] Dissertation Abstracts A: The Humanities and Social Sciences (Ann Arbor, Michigan: University Microfilms, 1967), Vol. 27, No. 8, pp. 2425-A-2426-A. (Order No. 67-297, 71 pages).

KOHLER, EMMETT THEOFORE. "AN INVESTIGATION OF CLOZE SCORES IN TERMS OF SELECTED COGNITIVE VARIABLES." UNPUBLISHED ED.D. DISSERTATION, THE FLORIDA STATE UNIVERSITY, 1966.

Purpose: The major purpose of this investigation was to study the relationships between cloze scores and selected cognitive variables. The principal question asked was, What are the relationships between scores obtained on the selected factor-pure cognitive ability tests and scores obtained on the cloze tests used? Additional, but subordinate questions asked were 1. What are the relationships between the various scores derived from the cloze tests? 2. What are the relationships between the cloze scores and a set of factorially more complex achievement and ability measures?

Principles, Concepts, or Procedures: The subjects for this study were 257 tenth-grade students from one Florida public high school. The data from these students were used for all the major analyses with the exception that only the data from 200 of these were used for the analyses of the relationships between the scores obtained on the Florida State Wide Ninth-grade Testing Program tests and those from the cloze tests.

The 250 word cloze tests were constructed from eight randomly selected passages by use of an every-fifth-word deletion process. There were two tests from four subject matter areas: (1) Biology, (2) Chemistry, (3) American Government, (4) World History. Three scores were obtained for each test: (1) Total number of words correctly replaced, (2) number of Content words correctly replaced, (3) number of Connective words correctly replaced.

A battery of eleven factor-pure tests described in the Manual for Kit of Reference Tests for Cognitive Factors and eight Florida State Wide Ninth-grade Testing Program tests which included the School and College Ability Test, and tests from the Metropolitan Achievement Tests battery were used as independent variables.

The major statistical techniques used were multiple linear regression analyses supplemented by canonical correlation analyses. The relationships between the various cloze scores were investigated through the use of factor analysis.

Conclusions: Several conclusions were drawn.

(1) The cloze tests appear to be relatively independent of the content covered by the tests and little additional informa-

tion was gained from the use of the Content and Connective word scoring schemes.

(2) There was a general factor present in the cloze scores which was believed to be factorially complex and highly related to the School and College Ability Test, Verbal score.

(3) Although the Florida State Wide Ninth-grade Testing Program battery generally did a better job of prediction than did the factor-pure test battery, the analyses of the cloze tests in terms of these factor-pure tests did provide information as to the abilities required in the successful completion of the cloze task. The tests used to measure these abilities are presented below in order of their importance.

(a) Wide Range Vocabulary. This ability was thought to be a reflection of the subject's knowledge of grammatical rules and breadth of vocabulary.

(b) Logical Reasoning. This was believed to be a somewhat formal reasoning ability which is related to the use of rather rigid sets of rules to solve problems.

(c) Inference. This measure of reasoning was believed to reflect a less formal, more flexible approach to the problem of the cloze task.

(d) Addition. This test was believed to represent a speed factor. Since the time allowed for each cloze test was fixed, this ability to rapidly cover the test could provide the student with more exposure to the contextual clues found within the cloze passage.

(e) Hidden Patterns. This measure of Flexibility of Closure was thought to be important because there are times when given solutions are technically correct but must be cast aside in light of the contextual restraints imposed by the passage.

(f) The abilities measured by the following tests appeared to be relatively less important in the successful completion of the cloze task.

Planning Air Maneuvers
Map Planning
Object Synthesis

Picture-Number
Cube Comparison
Figure Classification[1]

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[1] Dissertation Abstracts A: The Humanities and Social Sciences (Ann Arbor, Michigan: University Microfilms, 1966), Vol. 27, No. 1, pp. 114-A, 115-A. (Order No. 66-5454, 105 pages).

LISMAN, LINDA C. "VOWEL DELETION AND CLOZE TESTS COMPARED WITH A READING ABILITY TEST." UNPUBLISHED MASTER'S THESIS, RUTGERS, THE STATE UNIVERSITY OF NEW JERSEY, 1971.

Purpose: The author does not state her purpose.

Principles, Concepts, or Procedures: Fifty-seven seventh and 60 eighth graders were divided into three reading ability groups. All were given the Wechsler Intelligence Scale for Children (WISC) prior to the study and the Gates-MacGinitie Reading Test--Survey E for grades 7 to 9 immediately after the study. A practice sample was given before the tests on prepared vowel deletion and cloze passages.

Conclusions: Performance on both tests was correlated with each other, with scores of the reading test, and with the WISC scores. Correlation between vowel deletion and cloze scores was found to be .43 for the total group. Vowel deletion correlated significantly with the reading test (speed, .51; accuracy, .63; vocabulary, .57; and comprehension, .51), and with the IQ test (performance, .39; full scale, .45; and verbal, .37). The correlation was higher for eighth graders on speed, accuracy, and vocabulary, but higher for the seventh graders on comprehension. The cloze test correlated with the reading test as follows: speed, .29; accuracy, .41; vocabulary, .55; and comprehension, .60. It correlated with the IQ test as follows: performance, .28; full scale, .46; verbal, .50. Generally, for all measures except verbal IQ and reading comprehension, the vowel deletion correlations were higher than or almost identical to the cloze correlations for the total population. Tables, a bibliography, and appendixes are included.[1]

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[1] Research in Education (Washington, D.C.: United States Government Printing Office, 1971), Vol. 6, No. 12, p. 77. (ED 053 894, 64 pages).

MOSBERG, LUDWIG; POTTER, THOMAS C.; AND CORNELL, ROBERT K. THE RELATION BETWEEN CLOZE AND MULTIPLE-CHOICE TEST SCORES AS A FUNCTION OF RELATIVE PARAGRAPH DIFFICULTY AND GRADE LEVEL. INGLEWOOD, CALIFORNIA: SOUTHWEST REGIONAL LABORATORY FOR EDUCATIONAL RESEARCH AND DEVELOPMENT, 1968.

Purpose: This study investigated the relationship between cloze and multiple-choice test scores in grades five and eight when reading passage difficulties were two years below, two years above, and at subject's grade level.

Principles, Concepts, or Procedures: Materials were drawn from the Rate Builders section of the SRA Reading Laboratory Kits. Between three and five questions were added to those following the selections. A mean ratio of 3:8 was maintained between multiple-choice items and cloze deletions.

Every-fifth-word deletions were made and five test forms constructed. Final data were obtained for 708 fifth graders and 708 eighth graders who had been assigned to either a cloze or a multiple-choice condition. At each grade level, matched pairs were assigned to passage difficulty levels. Within these levels, subjects were randomly assigned to one of fifteen selections at that level.

All subjects were given 25 minutes to complete the two tests. California Achievement Test reading scores were obtained six months previously.

Conclusions: Among the findings were the following:

1. The overall performance of the eighth graders was superior to that of the fifth graders.

2. The cloze test was sensitive to grade level but less sensitive to passage difficulty.

3. . . . one should proceed cautiously when using cloze test scores as measures of comprehension (or predictors of MC test score magnitudes) until a more detailed analysis of what the cloze procedure is measuring and of grade and difficulty ranges at which the cloze procedure is an appropriate measure have been established. (21)

RANKIN, EARL FREDERICK, JR. "AN EVALUATION OF THE CLOZE PROCEDURE AS A TECHNIQUE FOR MEASURING READING COMPREHENSION." UNPUBLISHED PH.D. DISSERTATION, UNIVERSITY OF MICHIGAN, 1958.

Purpose: The cloze procedure, devised by Taylor, is a word-deletion technique for constructing comprehension tests. Words to be deleted are selected mechanically and blank spaces are substituted. Subjects are instructed to predict from the remaining context what word belongs in each space.

The study was an evaluation of the validity, performance, and utility of cloze tests based on "general science material" used by participants in a college reading-improvement program. It was postulated that comprehension tests emphasizing the measurement of either the substantive content of a message or the interrelationships between ideas could be constructed by varying the type of words deleted: the restriction of word deletion to nouns and verbs measures primarily the comprehension of substantive content. The postulate was confirmed, and this form of the cloze procedure was used in the investigation.

Principles, Concepts, or Procedures: Part I was a study of the validity of the cloze test as a measure of (1) general reading skill, (2) pre-reading and post-reading knowledge of the content of a specific article, and (3) "specific reading comprehension" (i.e., the gain between pre- and post-reading tests, attributable to learning through reading). The *Diagnostic Reading Tests: Survey Section* was used as a criterion of general reading skill, and a multiple-choice test constructed for the purpose was used as a criterion of pre- and post-reading knowledge. Validity was ascertained both for the total sample and for sub-groups defined by status on the following organismic variables: (1) reading rate, (2) intelligence, (3) previous knowledge, (4) level of permeability, (5) level of anxiety, and (6) four personality types (defined by combinations of high and low status on the permeability and anxiety dimensions). Personality measurements were made with the *SA-S* Senior Scales.

In Part II, mean performance on pre- and post-reading tests and the "gain score" was studied as a function of the above organismic variables.

In Part III, the usefulness of the procedure for the construction of multiple forms of a test for measuring improvement in reading was considered. The equivalence of four cloze test forms was studied, and an attempt was made to determine the sensitivity of the test to change in reading comprehension for the total group and for the aforementioned subgroups.

Conclusions: Correlations ranging from .29 to .48 were obtained between cloze tests and the survey test. Validity coefficients of .59 and .56 were obtained for the tests as measures of pre- and post-reading knowledge of a specific article. Significant differences were obtained between pre- and post-tests. It was concluded that this form of the cloze procedure produces tests which are not very accurate measures of general reading skill but are sufficiently accurate for measuring pre- and post-reading knowledge and "specific reading comprehension."

Pre-test reliability, validity, and mean scores were significantly higher for low permeable than for high permeable subjects. Such differences did not exist on the post-test. This outcome was interpreted as a reflection of the need of permeable individuals for structure in making cloze responses and of the increased structure provided by reading an article.

No differences were found between "gain scores" as a function of any organismic variable. Unlike other reading tests, this measure gives no advantage to individuals with high intelligence or pre-reading knowledge.

Apparently, anxiety reactions to one test form yielded equivocal results in the improvement study. It was concluded that the use of multiple forms to measure sub-group differences in improvement is not desirable unless the equivalence of each form for the specified sub-groups is determined in advance or unless procedures can be devised to reduce such lack of equivalence.[1]

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[1] Dissertation Abstracts (Ann Arbor, Michigan: University Microfilms, 1958), Vol. 19, No. 4, pp. 733-734. (L. C. Card No. Mic 58-3722, 234 pages).

RANKIN, EARL F., AND CULHANE, JOSEPH W. "COMPARABLE CLOZE AND MULTIPLE-CHOICE COMPREHENSION TEST SCORES." JOURNAL OF READING, 13 (1969), 193-198.

Purpose: The study was designed to replicate Bormuth's study relative to comparable scores on cloze and multiple-choice comprehension tests.

Principles, Concepts, or Procedures: A pilot study preceded the main study which included as subjects 105 fifth grade pupils. Five 50-item cloze tests and five 31-item multiple choice tests were constructed over five World Book Encyclopedia articles which ranged in Fry readability from grade five to grade eight. The unmutilated passage and multiple-choice questions were administered four days after the cloze test. Only exact replacements were scored correct.

Conclusions: Bormuth's findings were corroborated. A 75% multiple-choice score is roughly equal to a cloze score of 44% (Bormuth) or 41% (Rankin and Culhane) while a 90% multiple-choice score is roughly equal to respective cloze scores of 57% and 61%.

RANKIN, EARL F., AND DALE, LOTHAR H. "CLOZE RESIDUAL GAIN - A TECHNIQUE FOR MEASURING LEARNING THROUGH READING." THE PSYCHOLOGY OF READING BEHAVIOR. EDITED BY G. B. SCHICK AND M. M. MAY. EIGHTEENTH YEARBOOK OF THE NATIONAL READING CONFERENCE. MILWAUKEE, WISCONSIN: NATIONAL READING CONFERENCE, 1968, 17-26.

Purpose: The authors investigated the cloze residual gain technique wherein the amount of knowledge learned by reading is separated from that known before reading.

Principles, Concepts, or Procedures: Subjects were 174 college students. The materials consisted of an unmutilated article concerning temperature, two cloze tests made over the passage, and a multiple-choice comprehension test. A structural cloze test deleted every fifth word while a lexical cloze test deleted nouns and verbs.

Each class involved was divided evenly with half taking a cloze test followed by the multiple-choice test and the other half taking these in reverse order. The unmutilated passage was not used until thirty days later after which the identical tests were re-administered to each subject. The Davis Reading Test was the standardized measure used.

Conclusions: Among the findings were the following:

1. Cloze is a sensitive measure of reading gain.

2. Structural cloze reading gains are related to tests of post-reading knowledge and standardized reading tests while lexical gains are related only to post-reading knowledge.

RANKIN, EARL F., AND HESS, ALLEN K. "THE MEASUREMENT OF INTERNAL (INTRA-ARTICLE) READING FLEXIBILITY." PAPER PRESENTED AT THE NATIONAL READING CONFERENCE, ATLANTA, GEORGIA, DECEMBER 4-6, 1969.

Purpose: The effects of training on internal reading flexibility (intra-article flexibility) and the relationships between such flexibility and overall reading speed, reading comprehension, anxiety level, and introversion-extraversion were investigated.

Principles, Concepts, or Procedures: Flexibility coefficients were computed before and after training for the total group of 255 college subjects and for sub-groups of 127 subjects who fell in the top or bottom half of the distribution for reading speed. Desensitizing exercises were employed to allow subjects to adapt to the reading interruptions necessary to measure internal flexibility. Subjects were enrolled in a college reading program. Pretest and post-test measures were made with alternate forms of the *Diagnostic Reading Test: Survey Section*. Test passage difficulty was determined by the cloze technique. Anxiety level and introversion-extraversion were measured by the *SA-S Senior Scales*.

Conclusions: Results indicated that it was possible to desensitize subjects to allow for measuring internal flexibility. However, the statistical procedures used and/or the restricted range of reading ability and reading difficulty of the selections may have obscured between group differences of flexibility coefficients. References are included.[1]

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[1] *Research in Education* (Washington, D.C.: United States Government Printing Office, 1970), Vol. 5, No. 8, p. 89. (ED 038 247, 14 pages).

RUDDELL, ROBERT BYRON. "AN INVESTIGATION OF THE EFFECT OF THE SIMILARITY OF ORAL AND WRITTEN PATTERNS OF LANGUAGE STRUCTURE ON READING COMPREHENSION." UNPUBLISHED ED.D. DISSERTATION, INDIANA UNIVERSITY, 1963.[1]

Purpose: The purpose of this study was to investigate the effect of the similarity of oral and written patterns of language structure on reading comprehension of fourth grade children.

Principles, Concepts, or Procedures: Two research hypotheses were designed for the purpose of this investigation. These hypotheses were: (1) The degree of comprehension with which written passages are read is a function of the similarity of oral patterns of language structure to written patterns of language structure in reading passages. (2) The comprehension scores on reading passages that utilize high frequency patterns of oral language structure will be significantly greater than the comprehension scores on reading passages that utilize low frequency patterns of oral language structure. Six exploratory questions were designed to investigate the effect of subject background variables on comprehension scores over written material that utilizes high and low frequency patterns of oral language structure. These variables consisted of the occupational status of the father, the educational background of the parents, and the intelligence, mental age, chronological age, and sex of the subjects.

A series of structurally controlled reading passages having a wide range of similarity indexes were designed to test the hypotheses. These indexes were determined by assigning empirically determined frequency values of oral patterns of language structure of fourth grade children to identical written patterns of language structure in the reading passages and totaling the assigned frequency values. The empirically determined frequency values of the oral language patterns of fourth grade children were obtained through calculations based on data collected in a study by Strickland. Vocabulary difficulty, sentence length, specific subject-matter content and passage length were equated in the reading passages. Cloze comprehension tests were constructed over the reading passages and administered to 131 randomly selected subjects on the fourth grade level in the Bloomington Metropolitan School System, Bloomington, Indiana. Pertinent background data were obtained from parents and teachers. A one-way and two-way analysis of variance using a repeated measurement design and the statistic Epsilon were employed in the treatment of data.

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[1] See also Robert B. Ruddell, "The Effect of Oral and Written Patterns of Language Structure on Reading Comprehension," Appendix.

Conclusions: Highly significant differences (beyond the .01 level) were found between comprehension scores thus supporting the two research hypotheses. Significant differences were found in comprehension scores over reading passages utilizing high and low frequency patterns of oral language structure in relation to all subject background variables with the exception of the sex variable. An interaction significant at the .05 level was found in relation to the sex variable.

The conclusions related to the two research hypotheses were: (1) Reading comprehension is a function of the similarity of oral patterns of language structure to written patterns of language structure used in reading materials. (2) Reading comprehension scores over materials that utilize high frequency patterns of oral language structure are significantly greater than reading comprehension scores over materials that utilize low frequency patterns of oral language structure. The conclusions related to the exploratory questions stated that the occupational status of the father, the educational background of the parents, and the intelligence, mental age, and chronological age of the subjects are significantly related (.01 level) to reading comprehension over reading materials that utilize high and low frequency patterns of oral language structure. Sex differences are not significantly related to reading comprehension though there is some evidence to suggest that boys have disproportionally greater difficulty than girls in comprehending reading material written with low frequency patterns of oral language structure.[1]

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[1] Dissertation Abstracts (Ann Arbor, Michigan: University Microfilms, 1964), Vol. 24, No. 12, Part I, pp. 5207-5208. (Order No. 64-3826, 207 pages).

SAWYER, RITA, AND BRAAM, LEONARD S. "AN EXPERIMENT COMBINING CLOZE PROCEDURE WITH SPEED OF COMPREHENSION INSTRUCTION." PROCEEDINGS OF THE COLLEGE READING ASSOCIATION. EDITED BY CLAY A. KETCHAM. SYRACUSE, NEW YORK: COLLEGE READING ASSOCIATION, 1964, 27-33.

Purpose: The authors report an investigation into the effect of instruction in speed of comprehension upon reading comprehension developed from practice with cloze exercises.

Principles, Concepts, or Procedures: A group of 134 college freshmen were divided into one control and two experimental groups. Speed was developed by instructing students to be "flexible" in their reading. The Power Builders of the SRA Reading Laboratory were used.

For developing comprehension, one control group used college type reading improvement material and answered the usual types of questions.

The experimental group used cloze materials which were graded into nine levels. Each selection of 500 words had two cloze forms--unmutilated and every-tenth-word deletions. Depending on progress, a subject could complete the materials in a minimum of 27 or a maximum of 48 lessons. Subjects scanned the unmutilated selection for one minute before completing the mutilated form. Both synonyms and exact replacements were accepted. Students and instructor discussed responses at variance with the expected replacements.

The second control group was given no special reading instruction. All groups were administered the Cooperative Reading Test at the beginning and end of the semester.

Conclusions: The experimental group achieved higher gains in speed of comprehension than did control group one, a comparable group verbally, or than did control group two, a more skilled group verbally according to ACE scores.

". . . work on speed of comprehension is not antithetical to work with cloze exercises and . . . the two can be combined to give greater reading power." (33)

SIKES, HELEN CRUSE. "A COMPARATIVE STUDY OF CLOZE PROCEDURE SCORES ON ORIGINAL AND PUBLISHED MATERIALS." UNPUBLISHED ED.D. DISSERTATION, UNIVERSITY OF SOUTHERN MISSISSIPPI, 1971.

Purpose: This study was designed to compare the readability of creative stories written by children with that of published materials. The following three aspects of readability were considered: (1) vocabulary load, (2) interest, and (3) comprehension.

The problem, or comparison is examined according to the following questions: Does a significant difference exist between original and published children's reading materials in vocabulary usage and degree of personal references? Is there a significant difference between children's comprehension scores on original and published materials as measured by the Cloze procedure reading test? Do comprehension scores obtained on a standardized reading test show a relationship to those resulting from the child's responses of cloze procedure tests?

Principles, Concepts, or Procedures: Two groups of children were involved in the study. Group 1 was composed of 222 fifth and sixth grade students at Hazel Park Elementary School, and Group II was comprised of 224 fifth and sixth grade students at Bridgedale Elementary School. Both schools are in Jefferson Parish, Louisiana.

In March, 1970, the comprehension section of the Gates-MacGinitie Reading Test was administered. A "t" test revealed no significant difference between means for the two groups.

At Hazel Park, eighty children scored between grade levels 5.5 and 6.5. A table of random numbers was used to select twenty-five of these students to write original stories.

At Bridgedale, ninety children scored between 5.5 and 6.5 grade levels. Fifty of these students (five groups of ten each) were randomly selected to take cloze tests.

Five selections were used to construct cloze passages. The length of each passage was approximately 250 running words and contained fifty items in that every fifth word was deleted and substituted with a blank.

Materials came from three sources: (1) SRA, (2) original stories, and (3) published materials. A practice test was constructed from the SRA material. It was not scored or used in the data analysis. Four tests, two original stories randomly selected and two published materials of the same grade equivalent, were constructed into five forms each.

The twenty tests were stacked in random order with regard to group and passage. They were administered to the fifty students in Group II, one a day for five consecutive days. The groups were staggered with regard to the time of day that the tests were taken.

The tests were scored for exactness in replacement of original word.

Conclusions: Hypothesis 1 stated that there would be no significant difference in the number of words not included in the Dale List of 3,000 Familiar Words when children's original stories were compared with published materials. To test this hypothesis, the "t" test for independent groups, or uncorrelated measures, was used. This hypothesis was retained.

Hypothesis 2 specified that there would be a significant difference in the number of personal inferences when children's original stories were compared with published materials. The obtained "t" of 4.1398 between personal inferences for published and original stories was greater than the 2.71 need to be significant at the .01 level of confidence. Therefore, the null hypothesis of no difference was rejected.

Hypothesis 3 stated that there would be a significant difference in comprehension scores, as measured the cloze procedure, comparing original and published children's reading materials. The obtained F of 22.48 for treatments was greater than the table value of 3.94 at the .01 level of confidence. Therefore, the null hypothesis was rejected.

Hypothesis 4 was retained. There was no significant relationship between cloze procedure test scores and Gates-MacGinitie comprehension scores at the .05 level of confidence.

The results of the study indicated that students comprehend material written by their peers over published materials with a greater degree of accuracy and understanding.[1]

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[1] Dissertation Abstracts International A: The Humanities and Social Sciences (Ann Arbor, Michigan: University Microfilms, 1971), Vol. 32, No. 5, p. 2320-A. (Order No. 71-28,847, 171 pages).

SMITH, WILLIAM LEWIS. "THE EFFECT OF SYNTAX ON READING." UNPUBLISHED PH.D. DISSERTATION, THE FLORIDA STATE UNIVERSITY, 1969.

Purpose: The purpose of the present research was to determine whether more mature syntactic structure increases reading difficulty, or whether all students, regardless of grade level, have the same syntactic skills and thus do read with equal facility material written at different levels of syntactic maturity, providing the vocabulary and content are held constant.

Principles, Concepts, or Procedures: Two sets of test instruments were constructed for this research, each consisting of passages written at four levels of syntactic maturity: 4th grade, 8th grade, 12th grade, and Skilled Adult. The levels were established using the findings from recent research on the syntactic maturation of school children's writing.

The cloze technique was used to test reading comprehension. For each set of test instruments, all combinations of the "every-fifth word" deletion pattern were employed.

Two experiments were conducted, each using a different set of instruments. The same subjects were used in both experiments although there was a 6% attrition in the second experiment. From each of the grades 4 through 12, 4 groups of 30 subjects were randomly selected, each of the groups being administered test instruments at one of the 4 levels of writing.

It was hypothesized that, in each experiment, there would be no significant differences: 1) in comprehensibility between the 4 levels of writing at each grade level of reader, and 2) in comprehension between the 9 grade levels of readers on each level of writing.

Conclusions: Statistical analysis showed that only the 4th grade subjects significantly (.05) distinguished between the four levels of writing in both experiments. They read the 4th grade writing better than either the 8th grade or Skilled Adult writing. However, in both experiments the older subjects (grades 10, 11, and 12) consistently read all levels of writing significantly (.01) better than younger subjects (grades 4, 5, and 6).

A critical analysis of the data revealed that, in both experiments, the subjects in grades 4, 5, and 6 read the 4th grade writing best while the subjects in grades 8 through 12 read the 8th grade writing best. Furthermore, the older subjects read the 4th grade writing less well than they read all other levels. The data implied, therefore, that older subjects read syntactically more complex material with greater comprehension than they read less complex material. A tentative hypothesis was proposed for this phenomenon.

Four conclusions were drawn from this research:

1. For students in grades 4, 5, and 6, 4th grade writing appears to be easier to read than writing by more mature students. But for older students, 4th grade writing is not the easiest.

2. The more mature students (grades 8 through 12) find 8th grade writing easier to comprehend than either the simpler 4th grade writing or the more complex writing of the 12th graders or Skilled Adults.

3. Since 4th grade writing is the most redundant, word predictability (which is what the cloze technique measures) is more than a function of grammatical redundancy for the middle and upper grades. However, for the lower grade students, redundancy may be the only factor. This phenomenon is open for speculation.

4. The high correlation (.82) between the results of the two experiments indicates that the controlled instrument technique used in this study may provide an effective and simple tool for future research.[1]

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[1] Dissertation Abstracts International A: The Humanities and Social Sciences (Ann Arbor, Michigan: University Microfilms, 1970), Vol. 30, No. 11, pp. 4970-A, 4971-A. (Order No. 70-8575, 134 pages).

SWALM, JAMES E. "COMPARISON OF ORAL READING, SILENT READING, AND LISTENING COMPREHENSION ASSESSED BY CLOZE." UNPUBLISHED ED.D. DISSERTATION, RUTGERS UNIVERSITY, THE STATE UNIVERSITY OF NEW JERSEY, 1971.

Purpose: The purpose of this study was to determine the effect upon comprehension of oral reading, silent reading, and listening when using material that had a readability level equal to the grade level of the students being tested in second, third, and fourth grades.

Principles, Concepts, or Procedures: A separate story was used for each grade. It was anticipated that the results from this investigation would have applicability to instructional procedures in regular classrooms for the grade span studied.

Comprehension was measured by means of the cloze technique. A 10 percent random deletion pattern, omitting only lexical words, was used in making the deletions from the stories. Students completed the test using the same method of response as they had used in learning.

The sample population was composed of 324 students, 108 from each grade. They were assigned to the three testing methods by a process of stratified randomization. Thirty-six students were included in each testing group within a grade: 12 each from the above-average, average, and below-average groups, respectively.

Two null hypotheses were tested. The first was that there would be no difference in the comprehension of material read orally, read silently, or listened to on tape in the three grades. The second hypothesis was that there would be no difference in the level of comprehension for the above-average, average, or below-average reading categories for the three methods in the three grades. Statistical analysis of the data was done through the analysis of variance formulas and Tukey's Honestly Significant Difference Test. The significance level for the investigation was established at .05.

Conclusions: The results for the first hypothesis showed that significant differences among the three methods existed only at second grade. In this instance, oral reading was significantly better than either silent reading or listening. At third and fourth grades, no significant differences were noted among the three methods.

The results for the second hypothesis showed that the reading level of the student was important for determining comprehension effectiveness with the three methods in each grade. Above-average students exhibited a strong tendency to comprehend better when reading than they did when listening, with significance being reached in second and fourth grades. At second grade both reading approaches were equally effective, while at third and fourth grades silent reading was slightly better than oral reading. The students with average reading ability comprehended equally well with the three methods of learning regardless of grade.

For the below-average students, listening became the most effective method for comprehension, followed by oral reading and then silent reading. Listening was significantly higher than silent reading at all three grades, but significantly different from oral reading at only third grade. Hence, there was a tendency for listening and oral reading to be about the same in comprehension effectiveness for this group, especially at second and fourth grades.

The following conclusions were drawn from the results of this investigation. When the students' reading abilities were above the difficulty level of the article, they comprehended better with some form of reading than they did with listening. When the students' reading abilities and the readability level of the article were about the same, the three learning methods resulted in about the same amount of comprehension. When the students' reading abilities were below the difficulty level of the article, listening was better for comprehension purposes than silent reading. There was also a tendency exhibited with below-average readers for oral reading to follow listening in comprehension effectiveness at the second and fourth grades.[1]

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[1] Dissertation Abstracts International A: The Humanities and Social Sciences (Ann Arbor, Michigan: University Microfilms, 1972), Vol. 32, No. 7, pp. 3578-A, 3579-A. (Order No. 72-1102, 160 pages).

TAYLOR, WILSON L. "CLOZE READABILITY SCORES AS INDICES OF INDIVIDUAL DIFFERENCES IN COMPREHENSION AND APTITUDE." JOURNAL OF APPLIED PSYCHOLOGY, 41 (1957), 19-26.

Purpose:

> This experiment specifically tested the hypothesis that the cloze scores of individual subjects would correlate significantly with their performances on (a) carefully constructed preknowledge and immediate-recall tests of the content of the material presented, and (b) a standardized aptitude or "intelligence" test of supposed "ability to understand." (19)

Principles, Concepts, or Procedures: Three cloze forms--"any," "easy," and "hard"--were prepared from a 20% sample of an Air Force technical article. "Before" versions of each form and a pre-test of comprehension were administered to the approximately 58 men in each of three sections. About a week later, the complete article was distributed for study, and the recall test of comprehension and the "after" cloze versions of each cloze form were administered. Only exact-word replacements were counted in the scoring. All subjects had Armed Forces Qualification Test scores on record as a measure of mental ability.

Conclusions:

> For each of the three groups, correlation coefficients were computed between all 10 possible pairings of five distributions of scores (before- and after-study cloze, pre- and post-tests of comprehension, and AFQT). All 30 such coefficients were found to be positive and significant to beyond the .001 level of confidence. (26)

WEAVER, WENDELL; KINGSTON, ALBERT J.; BICKLEY, A. C.; AND WHITE, WILLIAM F. "INFORMATION-FLOW DIFFICULTY IN RELATION TO READING COMPREHENSION." JOURNAL OF READING BEHAVIOR, 1 (1969), 41-49.

Purpose:

This study explores certain of the relations between a reading comprehension measure, accuracy of communication measures (the cloze tests), association and rote learning tasks, and personality and attitudinal variables. (43)

Principles, Concepts, or Procedures: Subjects were 53 college sophomores who were administered The Davis Reading Test, The Modern Language Aptitude Test, the Cattell 16 PE, and the Semantic X Differential. Two cloze tests were made over a reading passage--one after and one before the passage was read. Two rating scales of bi-polar adjectives were also administered.

Conclusions:

The results of this study provide further evidence for the interrelationships of rote learning processes and so-called higher level mental processes. The best predictors of reading comprehension and post-cloze scores are sub-tests of the MLAT which require the subject to learn by rote material with which he has little or no previous familiarity. . . . (47)

CHAPTER IV

THE CLOZE PROCEDURE AS A MEASURE OF LANGUAGE FACILITY

The cloze procedure has permitted researchers to use the language of individuals to illustrate characteristics of certain personality and physical disorders.

In using the cloze procedure with deaf and hearing people, Cohen[1] studied a population of children and adults to compare the redundancy of story paraphrases written by deaf and hearing children, to determine their facility in making use of this redundancy to reconstruct the paraphrases.

Marshall[2] investigated the effect of contextual constraint on deaf and hearing fourth grade children, and Moores[3] applied the cloze procedure to an assessment of the psycholinguistic abilities of deaf children.

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[1] Sandra Ruth Cohen, "Redundancy in the Written Language of the Deaf: Predictability of Deaf and Hearing Story Paraphrases" (unpublished Ph.D. dissertation, Columbia University, 1964).

[2] William James Aloysius Marshall, "Investigating the Effect of Contextual Constraint on Deaf and Hearing Children at the Fourth Grade Reading Level, Using the Cloze Procedure" (unpublished Ed.D. dissertation, University of Illinois at Urbana-Champaign, 1970).

[3] Donald Frederick Moores, "Applications of 'Cloze' Procedures to the Assessment of Psycholinguistic Abilities of the Deaf" (unpublished Ph.D. dissertation, University of Illinois, 1967).

Specific problems related to speech have been studied by means of the cloze procedure. Fillenbaum and Jones[1] applied the technique to a study of aphasic speech. Honigfeld[2] evaluated the effect of drugs on speech, and the ability of schizophrenics to understand normal, psychotic, and pseudo-psychotic speech.

Attitude and personality studies have been facilitated by applications of the cloze procedure. Attitudes of college students toward capital punishment were studied by Manis and Dawes.[3] Honigfeld, Platz, and Gillis[4] investigated the relationship between authoritarianism and verbal style. The relationship between reading test reliability and validity, and introversion-extroversion of college students has been investigated by Rankin.[1]

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[1] Samuel Fillenbaum and Lyle V. Jones, "An Application of 'Cloze' Technique to the Study of Aphasic Speech," Journal of Abnormal and Social Psychology, 65 (1962), 183-189.

[2] Gilbert Honigfeld, "Effect of an Hallucinogenic Agent on Verbal Behavior," Psychological Reports, 13 (1963), 383-385; Gilbert Honigfeld, "The Ability of Schizophrenics to Understand Normal, Psychotic, and Pseudo-Psychotic Speech," Diseases of the Nervous System, 24 (1963), 692-694.

[3] Melvin Manis and Robyn M. Dawes, "Cloze Scores as a Function of Attitude," Psychological Reports, 9 (1961), 79-84.

[4] Gilbert Honigfeld, Arthur Platz, and Roderic D. Gillis, "Verbal Style and Personality: Authoritarianism," Journal of Communication, 14 (1964), 215-218.

Other studies have utilized the cloze procedure to investigate the grammar and syntax of the English language. Coleman and Blumenfeld[2] compared nominalized sentences with their grammatical transformations for comprehensibility. Louthan[3] studied the effects on comprehension of various systematic grammatical deletions.

Clark[4] and Clark, Williams, and Tannenbaum[5] investigated, by means of the cloze procedure, the agreement between encoders and decoders with respect to syntactic and referential information. The ability of encoders and decoders in predicting omissions was also investigated by

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[1] Rankin, "Reading Test Reliability and Validity as Function of Introversion-Extroversion," Journal of Developmental Reading, 6 (1963), 106-117.

[2] E. B. Coleman and J. P. Blumenfeld, "Cloze Scores of Nominalizations and Their Grammatical Transformations Using Active Verbs," Psychological Reports, 13 (1963), 651-654.

[3] Vincent Louthan, "Some Systematic Grammatical Deletions and Their Effects on Reading Comprehension," English Journal, 54 (1965), 295-299.

[4] Ruth Anne Clark, "The Influence of Syntactic and Referential Information on Word Predictability" (unpublished Ph.D. dissertation, The University of Wisconsin, 1964).

[5] Ruth Anne Clark, Frederick Williams, and Percy H. Tannenbaum, "Effects of Shared Referential Experience Upon Encoder-Decoder Agreement," Language and Speech, 8 (1965), 253-262.

Weaver and Bickley.[1]

To determine whether differences existed in the predictability of lexical and structural deletions, Weaver[2] applied the cloze procedure. Weaver and Kingston[3] investigated the relationship of cloze tests to a number of selected measures of language ability.

Comparative differences between oral and written samples of prose were studied by DeVito.[4]

Several studies have utilized the cloze procedure to investigate language characteristics of educable mentally retarded children. Brooks[5] hypothesized that non-intellectual factors, such as personality variables, have a significant effect on the reading behavior of mentally retarded children.

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[1] Wendell W. Weaver and A. C. Bickley, "Some Differences in Encoding and Decoding Messages," Journal of the Reading Specialist, 7 (1967), 18-25.

[2] Wendell William Weaver, "An Examination of Some Differences in Oral and Written Language Using the Cloze Procedure" (unpublished Ed.D. dissertation, University of Georgia, 1961).

[3] Wendell W. Weaver and Albert J. Kingston, "A Factor Analysis of the Cloze Procedure and Other Measures of Reading and Language Ability," Journal of Communication, 13 (1963), 252-261.

[4] Joseph A. DeVito, "Comprehension Factors in Oral and Written Discourse of Skilled Communicators," Speech Monographs, 32 (1965), 124-128.

[5] Sadye Tune Brooks, "Effects of Locus of Control and Anxiety on the Ability of Mentally Retarded Children to Use Context Clues in Reading" (unpublished Ph.D. dissertation, George Peabody College for Teachers, 1962).

The grammatical ability of these children was studied by Semmel, Babbitt, and Bennett,[1] while their oral language proficiency was assessed by Goodstein.[2] Ramanauskas[3] assessed the sensitivity of educable mentally retarded children to contextual constraints beyond a sentence.

The cloze procedure has also found application in studies of listening comprehension. Carver _et al_.[4] investigated sources of individual differences in listening comprehension by means of speech samples and cloze testing, while Williams[1] applied the semantic differential and the cloze procedure to a study of listening comprehension when tape-recorded materials were used.

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[1] Melvyn I. Semmel, Loren S. Babbitt, and Stanley W. Bennett, "Performance of EMR and Nonretarded Children on a Modified Cloze Task," _American Journal of Mental Deficiency_, 74 (1970), 681-688.

[2] Henry Arthur Goodstein, "The Performance of Educable Mentally Handicapped and Average-IQ Children on Two Modified Cloze Tasks for Oral Language" (unpublished Ph.D. dissertation, The University of Connecticut, 1969).

[3] Sigita Ona Ramanauskas, "The Effect of Contextual Constraints Beyond a Sentence on Cloze Responses of Children in Special Classes for the Educable Mentally Retarded" (unpublished Ph.D. dissertation, The University of Connecticut, 1971).

[4] Ronald P. Carver, _et al_., "Factor Analysis of the Ability to Comprehend Time-Compressed Speech" (paper presented at the Annual Meeting of the American Educational Research Association, New York, N. Y., February 4-7, 1971.

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[1] Frederick Dowell Williams, "An Experimental Application of the Semantic Differential and 'Cloze' Procedure as Measurement Techniques in Listening Comprehension" (unpublished Ph.D. dissertation, University of Southern California, 1962).

BROOKS, SADYE TUNE. "EFFECTS OF LOCUS OF CONTROL AND ANXIETY ON THE ABILITY OF MENTALLY RETARDED CHILDREN TO USE CONTEXT CLUES IN READING." UNPUBLISHED PH.D. DISSERTATION, GEORGE PEABODY COLLEGE FOR TEACHERS, 1962.

Purpose: The primary purpose of this study was to determine the effects of locus of control and anxiety-as-drive on the ability of mentally retarded children to use context clues in reading. On the assumption that these variables were somewhat different attributes of personality in the mentally retarded population, it was reasoned that combined effects of the variables would eventuate in specific predictable behaviors in reading.

Principles, Concepts, or Procedures: Sixty educable mentally retarded children of both sexes were selected from the elementary grades of a State residential school for dependent children to serve as Ss. Four groups were equated on IQ, locus of control and manifest anxiety using scores from the Peabody Picture Vocabulary Test, the Bialer-Cromwell Children's Locus of Control Scale, and the Children's Manifest Anxiety Scale. The CA range was 9-2 to 15-0 with a mean of 12-8; IQ, 55 to 85, with a mean of 73.45; and, MA 6-3 to 11-4, with a mean of 8.6. The mean locus of control score for all Ss was 13.40 and the mean anxiety score was 25.03. Four subgroups of 15 Ss each were studied: e.g., internal locus of control with high anxiety, internal locus of control with low anxiety, external locus of control with high anxiety, and, external locus of control with low anxiety.

All subjects were individually administered the following treatments: (a) A reading pretest was administered to establish each S's basal (easy) and frustration (difficult) reading grade levels. (b) A sequence of three cloze procedure passages (context clue tests) equivalent to the S's basal reading grade level was administered. This sequence was accompanied by increasing monetary rewards and was defined as a success experience. (c) A sequence of three cloze procedure passages equivalent to the S's frustration reading grade level was administered. This sequence was accompanied by decreasing monetary rewards and was defined as a partial failure experience.

Conclusions: Analysis of variance was used to analyze cloze procedure scores. A correct response was defined as having supplied the correct word in a reading passage from which every fifth word had been replaced by a blank space. As predicted, the total group demonstrated a significant increment in performance on Sequence I under conditions of easy tasks and increasing monetary reward. Contrary to predictions, on Sequence II, under conditions of difficult tasks and decreasing monetary rewards the total group demonstrated a significant increment in performance. The magnitude of the increment on Sequence II was even greater than the increment on Sequence I. An analysis of gain scores of the four subgroups revealed an interaction effect between locus of control and anxiety. The gain scores of the internal locus of control with high anxiety Ss were significantly lower than the gain scores of all other groups. The combined effects of internal locus of control and low anxiety contributed to the best performance. Within the internal locus of control group, anxiety apparently played a significant role, and within the high anxiety group, locus of control played a significant role. However, within the external locus of control group, anxiety did not influence results significantly, and within the low anxiety group, locus of control did not contribute to a significant degree. Contrary to predictions, the analysis of shift scores from easy sequence to difficult sequence (Task 3-Task 4) revealed no significant differences between groups. However, the shift scores within each subgroup revealed a significant decrement in performance in shifting from easy to difficult tasks with the exception of the internal locus of control with high anxiety group which showed a nonsignificant decrement in performance.

The results of the study supported the primary thesis of the study, i.e., nonintellectual factors, such as personality variables, do play a significant role in the reading behavior of educable mentally retarded children. The data suggested that a factor analytic approach to identifying group factors that influence reading behavior seemed warranted.[1]

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[1] Dissertation Abstracts (Ann Arbor, Michigan: University Microfilms, 1962), Vol. 23, No. 6, pp. 2003-2004. (Order No. 62-5667, 141 pages).

CARVER, RONALD P. ET AL. "FACTOR ANALYSIS OF THE ABILITY TO COMPREHEND TIME-COMPRESSED SPEECH." PAPER PRESENTED AT THE ANNUAL MEETING OF THE AMERICAN EDUCATIONAL RESEARCH ASSOCIATION, NEW YORK, N. Y., FEBRUARY 4-7, 1971.

Purpose: Sources of individual differences in the listening comprehension of speech presented at different rates were investigated by factor analyzing 11 variables, including measures of comprehension and field-independency.

Principles, Concepts, or Procedures: Twenty-two different tests, two for each variable, were administered to 50 college students.

Conclusions: It was concluded that: (a) the cloze type of test includes a large component of variance unrelated to comprehension and quite specific to the technique itself, and (b) the comprehension of highly speeded speech probably involves a perceptual ability to be field-independent in addition to a separate ability involved in comprehending speech at normal rates.[1]

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[1] Research in Education (Washington, D.C.: United States Government Printing Office, 1971), Vol. 6, No. 4, p. 163. (ED 045 702, 18 pages).

CLARK, RUTH ANNE. "THE INFLUENCE OF SYNTACTIC AND REFERENTIAL INFORMATION ON WORD PREDICTABILITY." UNPUBLISHED PH.D. DISSERTATION, THE UNIVERSITY OF WISCONSIN, 1964.

Purpose: The primary purpose of the present study was to investigate the effects of syntactic and referential information upon the predictability of semantic and function words in descriptive and interpretative messages. Predictions of relationships among the independent variables were summarized in the following two hypotheses:

Hypothesis I: Syntactic information enhances word predictability, and does so to a greater extent for function words than for semantic words.

Hypothesis II: Referential information enhances word predictability, with greater effect on semantic words than on function words, and to a greater extent in descriptive than in interpretative messages.

Principles, Concepts, or Procedures: The four independent variables--syntactic and referential information and message and word type--were related in a 2x2x2x2 analysis of variance model. Eight groups of 20 Ss (college students) attempted to replace missing words of both types. Each group reconstructed messages in one experimental condition, the experimental conditions being defined by all possible combinations of syntactic and referential information and message type. In the primary analysis, measures of word predictability were verbatim replacement of the original word (V), correct form class replacements (FC), and the ratio of V/FC. Two additional analyses were performed: (1) the influence of the independent variables upon entropy or dispersion of decoders' responses, necessarily using words rather than Ss as replicates, was determined; (2) the effects of syntactic and referential information and message type on V, FC, and V/FC were tested for words of each grammatical class.

Conclusions: Hypothesis I: Providing syntactic information significantly increased V and FC, in addition to bringing decoders' responses into closer agreement. Since the rise was greater for FC than V, V/FC decreased. V scores were significantly influenced, however, only in the case of function words.

Hypothesis II: Referential information caused a significant increase in V and V/FC and lessened dispersion among decoders' responses. Since referential information had no effect on FC, V/FC increased when the message stimulus was supplied. Referential information did increase the predictability of semantic words more than function words, but did not have a differential effect according to message type.

Major implications of the present research were related to both theory and methodology relevant to investigation of semantic and syntactic constraints in decoding behavior.[1]

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[1] Dissertation Abstracts (Ann Arbor, Michigan: University Microfilms, 1964), Vol. 25, No. 6, p. 3738. (Order No. 64-13,863, 147 pages).

CLARK, RUTH ANNE; WILLIAMS, FREDERICK; AND TANNENBAUM, PERCY H. "EFFECTS OF SHARED REFERENTIAL EXPERIENCE UPON ENCODER-DECODER AGREEMENT." LANGUAGE AND SPEECH, 8 (1965), 253-262.

Purpose: "The effects of referential experience upon encoder-decoder agreement were studied. . . ." (253)

Principles, Concepts, or Procedures: One hundred sixty undergraduate students were administered passages of approximately 180 words in which every fifth word had been deleted. Subjects were not told if the encoders had given descriptions or interpretations of the five paintings used in the study, and were simply instructed to replace the words which they thought the encoder had used. Responses were scored on the basis of exact-word and form class replacements.

Conclusions:

1. ". . . the decoder group having the paintings available . . . /showed/ a higher agreement with the encoder . . . than the group without the paintings . . ." (256-257)

2. ". . . there was no significant difference between these two conditions with respect to grammatical replacement. . . ." (257)

3. ". . . the expected difference on the effect of shared referential information as between descriptive and interpretative messages failed to materialize." (257)

COHEN, SANDRA RUTH. "REDUNDANCY IN THE WRITTEN LANGUAGE OF THE DEAF: PREDICTABILITY OF DEAF AND HEARING STORY PARAPHRASES." UNPUBLISHED PH.D. DISSERTATION, COLUMBIA UNIVERSITY, 1964.[1]

Purposes: Language functioning in deaf children differs markedly from that in hearing children. One aspect of language in the deaf that has not been studied previously is the extent to which its redundancy differs from that of the language of the hearing.

Redundancy in language facilitates correct reception of a message. In the deaf construct messages with less redundancy than is generally found in the language of their hearing peers, they thereby decrease the likelihood that their messages will be correctly received. Alternatively, the deaf may share verbal habits with one another that make their messages more predictable to each other than they are to the hearing.

The present study used the cloze technique to study the comparative redundancy of story paraphrases written by deaf and hearing children and the ability of deaf and hearing groups to use this redundancy.

Principles, Concepts, or Procedures: The experimental groups were composed of 46 profoundly deaf and 46 hearing children matched for reading ability. At the first of two testing sessions each subject read a brief story and then rewrote that story in his own words. Following that session, words were periodically deleted from each child's paraphrase and from the original passages. At a second session, each subject restored deleted words to one original passage, one deaf paraphrase, and one hearing paraphrase, each involving a different and unfamiliar story.

Ninety-two additional hearing children provided information about the redundancy of the original passages. On separate occasions, 175 hearing graduate students and 43 additional deaf children reconstructed the deleted materials.

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[1] See also Sandra R. Cohen, "Predictability for Deaf and Hearing Paraphrases," Appendix.

Information about the redundancy of materials was supplied by the restorations made by the experimental groups and by the additional deaf and hearing subjects. Responses were scored on three criteria: verbatim (identical to deleted word), form class (same part of speech as deleted word), and sense (same meaning as deleted word). Additional analyses were carried out to locate the source of observed differences between the predictability of deaf and hearing paraphrases.

Conclusions:

1) Hearing subjects found deaf stories significantly less predictable than original or hearing stories.
2) Deaf subjects found different types of material equally predictable.
3) Hearing subjects made significantly more correct restorations to hearing and original stories than did deaf subjects, but on deaf stories there was no difference between the groups.
4) Even when the form class of a deleted word had been correctly identified, hearing subjects made significantly fewer correct restorations to deaf than to hearing or original stories.
5) Adult subjects found deaf stories significantly less predictable than hearing stories which were, in turn, significantly less predictable than original stories.
6) Average sentence length and total length of the paraphrases failed to differentiate between the groups.
7) Both deaf and hearing subjects had a slight tendency to select the more redundant words in the original story for use in their paraphrases of it.
8) Deaf paraphrases contained a higher proportion of ungrammatical sentences than did hearing paraphrases.

The difficulty of deaf paraphrases probably resulted from such factors as idiosyncratic usage, random errors, and deafisms. It was hypothesized that differences between deaf and hearing performance were due to the fact that the hearing had a better grasp of English than the deaf and therefore showed greater differentiation between good and poor language samples.

The failure of the deaf to learn the customary structure of English resulted in difficulty in receiving messages from hearing individuals and in constructing messages which could be correctly received by the hearing. The problem of communication between deaf and hearing individuals seems especially serious in view of the fact that the deaf subjects in this study were selected for their ability to perform well on verbal tasks.[1]

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[1] *Dissertation Abstracts* (Ann Arbor, Michigan: University Microfilms, 1966), Vol. 26, No. 8, p. 4792. (Order No. 65-13,929, 127 pages).

COLEMAN, E. B., AND BLUMENFELD, J. P. "CLOZE SCORES OF NOMINALIZATIONS AND THEIR GRAMMATICAL TRANSFORMATIONS USING ACTIVE VERBS." PSYCHOLOGICAL REPORTS, 13 (1963), 651-654.

Purpose: Nominalized sentences were compared for comprehensibility to their grammatical transformations using active verbs--"John's description of it . . ." versus "John described it."

Principles, Concepts, or Procedures: Subjects were 100 college freshmen each of whom was given a set of sentences of which half were the active-verb version and half were the nominalized version. Every sentence in the total design was written in these two styles. For each set (nominalized and active verb), five cloze tests were made by deleting every fifth word. "Then there were 10 different cloze tests for each sentence, ... Ss were divided into 10 groups of 10 each so that each cloze test was filled in by 10 Ss." (652) Synonyms were not accepted.

Conclusions: "The word patterns of the passages written in active verbs are more predictable than those written in nominalizations." (653)

DEVITO, JOSEPH A. "COMPREHENSION FACTORS IN ORAL AND WRITTEN DISCOURSE OF SKILLED COMMUNICATORS." SPEECH MONOGRAPHS, 32 (1965), 124-128.

Purpose: The purpose of the study was

> . . . to compare written and oral samples of the work of skilled communicators for (1) over-all comprehensibility as measured by cloze procedure and (2) significant differences in selected elements, supposedly related to ease of comprehension. (124)

Principles, Concepts, or Procedures: Ten university professors submitted written passages they considered the best examples of their writing styles. These were divided into three hundred-word segments from which three segments were drawn at random.

Oral discourse samples were obtained by asking general questions based on the submitted articles, recording the oral responses, and transcribing the content.

One oral and one written sample from each of the ten professors was drawn at random. Every fifth word was deleted. Subjects were 85 students ranging from sixteen to eighteen years of age. Each subject completed two oral and two written passages and all from different sources.

Conclusions: Among the conclusions drawn by the author is:

> Oral and written discourse, according to an application of cloze procedure, did not differ significantly in each of comprehension. Since the two sets of samples did not differ significantly on many of the specific criteria, this result is puzzling. One possible explanation is that the cloze procedure is not a sensitive device when the samples are at a relatively advanced level and the respondents are undergraduates. (126)

FILLENBAUM, SAMUEL, AND JONES, LYLE V. "AN APPLICATION OF 'CLOZE' TECHNIQUE TO THE STUDY OF APHASIC SPEECH." JOURNAL OF ABNORMAL AND SOCIAL PSYCHOLOGY, 65 (1962), 183-189.

Purpose: The speech of aphasics was studied by means of the cloze procedure.

Principles, Concepts, or Procedures: Samples of approximately 250 words were drawn from the free speech responses of nine aphasics and three normal subjects to selected cards of the Thematic Apperception Test. Three sets of booklets were constructed, each comprising, first, a normal subject's sample followed by three aphasic samples. Every-fifth-word deletions were used.

Subjects were college summer school students who, under timed conditions, were required to complete at least three-quarters of the blanks on each page of their booklets. For analysis purposes, the deleted words were classified according to form class.

Conclusions:

> The aphasic speech samples typically were less accurately completed than normal control samples, . . .; and given that the form class of an item had been correctly identified raters were still less likely to hit upon the exact missing word for the aphasic texts than for the normal control texts. (189)

In general the cloze procedure was found to provide an index of divergence from normal of a speaker's language.

GOODSTEIN, HENRY ARTHUR. "THE PERFORMANCE OF EDUCABLE MENTALLY HANDICAPPED AND AVERAGE-IQ CHILDREN ON TWO MODIFIED CLOZE TASKS FOR ORAL LANGUAGE." UNPUBLISHED PH.D. DISSERTATION, THE UNIVERSITY OF CONNECTICUT, 1969.

Purpose: It was hypothesized that: (a) EMH children are significantly poorer than average-IQ children in cloze performance; (b) the recognition cloze task would be significantly easier than the production cloze task; and (c) a significant interaction exists between IQ and task, with recognition exceeding production for the low-IQ sample to a greater extent than recognition exceeds production for the average-IQ children.

Principles, Concepts, or Procedures: A sample of public school educable mentally handicapped and a sample of average-IQ children were matched for mental age (approximately 9 years-5 months) and reading age (approximately 8 years-6 months). The samples were administered two modifications of cloze procedure that reflect the two important processes in oral language, production and recognition. The production task requires the child to complete appropriately a four-word sentence, in which one word has been randomly deleted. The recognition task differs in that it requires the child to choose the appropriate response from among four words to complete the sentence.

Conclusions: The null forms of the first two hypotheses were rejected ($p < .01$). The hypothesized interaction was not significant ($p > .01$). No qualitative differences were found in the performance of the two samples.

The results were interpreted as reflecting inefficiencies in the organization and retrieval of linguistic stimuli by low-IQ children. Implications for potential language training programs utilizing cloze procedure were discussed.[1]

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[1] Dissertation Abstracts International A: The Humanities and Social Sciences (Ann Arbor, Michigan: University Microfilms, 1970), Vol. 30, No. 8, p. 3320-A. (Order No. 70-1263, 53 pages).

HONIGFELD, GILBERT. "EFFECT OF AN HALLUCINOGENIC AGENT ON VERBAL BEHAVIOR." PSYCHOLOGICAL REPORTS, 13 (1963), 383-385.

Purpose: "This report is a first attempt to apply Cloze analysis to the study of the effect of drugs on 'understandability.'" (383)

Principles, Concepts, or Procedures: A drug was administered to a 22 year old medical student whose spontaneous speech samples were mutilated with every-fifth-word deletions when transcripts were made. Twenty-two subjects enrolled in an evening psychology class were required to restore the deleted words.

Conclusions:

> . . . our S's speech appears to be somewhat less understandable than a Life magazine article, but more easily understood than excerpts from the works of Francis Bacon or Benjamin Franklin. (384-385)

The author concludes that the cloze procedure is useful in evaluating drug effects.

HONIGFELD, GILBERT. "THE ABILITY OF SCHIZOPHRENICS TO UNDERSTAND NORMAL, PSYCHOTIC, AND PSEUDO-PSYCHOTIC SPEECH." DISEASES OF THE NERVOUS SYSTEM, 24 (1963), 692-694.

Purpose: The hypothesis that the speech of schizophrenics is more easily understood by other schizophrenics than other individuals was tested.

Principles, Concepts, or Procedures: By means of the cloze procedure, the understandability of six passages was determined by a group of 32 college students. Three passages of equal understandability were selected: a newspaper excerpt, an excerpt from an interview with a schizophrenic, and a spontaneous speech excerpt from a normal volunteer under the influence of an hallucinatory drug. These passages were then administered to sixty schizophrenic patients.

Conclusions: ". . . no evidence was found to support the clinical hunch that schizophrenics find it relatively easier to understand the speech of other schizophrenics." (693)

HONIGFELD, GILBERT; PLATZ, ARTHUR; AND GILLIS, RODERIC D.
"VERBAL STYLE AND PERSONALITY: AUTHORITARIANISM."
JOURNAL OF COMMUNICATION, 14 (1964), 215-218.

Purpose: This study sought to determine if the cautious approach of authoritarian persons finding themselves in novel problem situations would manifest itself in the style adopted by subjects in response to a cloze test.

Principles, Concepts, or Procedures: After authoritarianism scores were obtained for each of the 27 evening college students who were subjects, a series of six cloze tests was administered. Every-fifth-word deletions were used. The number of uncompleted items was computed as an estimate of cautiousness of style.

Conclusions: Subjects rated as highly authoritarian left a significantly greater number of blanks than did those receiving a low rating.

LOUTHAN, VINCENT. "SOME SYSTEMATIC GRAMMATICAL DELETIONS AND THEIR EFFECTS ON READING COMPREHENSION." ENGLISH JOURNAL, 54 (1965), 295-299.

Purpose: This study was undertaken to determine the effects of deleting certain grammatical classes of words.

Principles, Concepts, or Procedures: Twenty-four prose passages of 500 to 600 words were graded at a 5.0 readability index according to the Yoakam formula. Seven cloze forms were prepared, utilizing ten percent deletions according to seven grammatical classes. An eighth form was left intact as a control. All forms were followed by twelve comprehension questions: six factual and six inferential.

Each of the 236 seventh-grade subjects were assigned a cloze form at random and completed six exercises in it. The experiment lasted three weeks.

Conclusions: Among the findings are the following:

1. The control group was significantly superior in some instances to groups using cloze materials.

2. Noun deletions, specific verb deletions, and modifier deletions caused a marked loss in comprehension.

3. Deletions of prepositions, conjunctions, and pronoun substantives do not cause a loss of comprehension.

4. The deletion of noun determiners produced a significant gain in comprehension.

MANIS, MELVIN, AND DAWES, ROBYN M. "CLOZE SCORES AS A FUNCTION OF ATTITUDE." PSYCHOLOGICAL REPORTS, 9 (1961), 79-84.

Purpose: The authors

1. tested the assumption that

> . . . recipients, who disagree with the contents of a controversial statement, will be relatively insensitive to the redundancy of the communicator's words. (79)

2. investigated the likelihood that a subject's views would influence his responses in situations where ambiguity was increased by the omission of context clues.

Principles, Concepts, or Procedures:

> Two 400-word passages, one favoring capital punishment and one opposing it, were chosen. . . . For the "high-deletion" group (N = 41) every fourth word was removed; for the "low-deletion" group (N = 31) every eighth word was removed. (80)

Subjects were college students who, before replacing the missing words, rated a phrase concerning capital punishment on six scales of the semantic differential.

Conclusions:

1. Subjects showed a general tendency to perform more effectively on the passage that echoed their own views.

2. Connective deletions--verb auxiliaries, conjunctions, pronouns, and articles--were more highly related to attitude than were content deletions--nouns, verbs, adverbs.

> 3. . . . , these data support the proposition that cognitive performance may be adversely affected when the individual is presented with materials that contradict his beliefs. (84)

MARSHALL, WILLIAM JAMES ALOYSIUS. "INVESTIGATING THE EFFECT OF CONTEXTUAL CONSTRAINT ON DEAF AND HEARING CHILDREN AT THE FOURTH GRADE READING LEVEL, USING THE CLOZE PROCEDURE." UNPUBLISHED ED.D. DISSERTATION, UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN, 1970.[1]

Purpose: An area of research interest having received minimal attention in the past is the manner in which redundancy affects the deaf child's perception of the syntactic and semantic cues of written language.

Using cloze procedure to investigate linguistic competence, the study examined how, through manipulation of the overall language structure, a deaf child's psychological and linguistic perception of contextual cues affected his ability to make correct predictions on stimulus materials that had been selectively mutilated with respect to their contained grammatical construction.

Principles, Concepts, or Procedures: The experimental group consisted of 9 male and 15 female residential school deaf children with a mean grade reading score of 4.4 and 4.5, respectively on the Stanford Achievement Test. Their mean performance IQ's on the non-verbal Wechsler Intelligence tests were 107.7 and 100.8 for the males and females, with the mean age being 16 years, 1 month and 16 years, 5 months, respectively. The comparison group of 9 male and 15 female fourth and fifth grade hearing students had a mean grade reading achievement score of 4.3 and 4.4 respectively. Their mean IQ's on the non-verbal California Short-Form Test of Mental Maturity were 111.7 and 103.6 for the males and females with the mean age being 9 years, 6 months and 9 years, 5 months, respectively.

One 809 word passage was chosen as the stimulus material from a graded reading text with a reported difficulty level of 3.6 according to the Spache Readability Formula. This passage was then subjected to a total of 50 deletions occurring within grammatical constructions specifically identifiable by the surrounding content. This passage thus manipulated comprised the first of three levels of contextual constraint, namely, the connected discourse level.

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[1] See also William A. Marshall, "Investigating the Effect at Fourth Grade Reading Level Using the Cloze Procedure," Appendix.

While maintaining the same deletions, the discrete sentence level of contextual constraint was formed. These sentences were presented in a randomized order so as to preclude the possibility of any connected ideas being gleaned from them. Lastly, with these same deleted items still being used, the fragment level of contextual constraint was constructed with only a minimal number of contextual cues being retained so as not to destroy the earmarks of any given grammatical construction.

The criterion scores used for estimating the grammatical competence of both groups of subjects were the Close scores of correct Verbatim, correct Form Class and correct Verbatim given Form Class response. The statistical design used to analyze each of these scores was a factorial 3 x 2 x 2 (Contextual Constraint by Sex by Physical Status of Hearing) analysis of variance. When a significant F occurred for the variable of Contextual Constraint, the a posteriori "Tukey (a) Procedure" test of multiple comparisons was also used.

Conclusions: Three hypotheses were tested in the investigation.

Contextual Constraint. The hypothesis of no differences among the connected discourse, discrete sentence and fragment levels of contextual constraint was rejected at the one per cent level for the Verbatim and Form Class cloze criterion scores only. Although there were differences among the Verbatim given Form Class means, these differences were small enough to be attributable to chance.

In testing further for differences between pairs of means among the three levels of contextual constraint with the "Tukey (a) Procedure," significant differences were found only between the higher scores of the connected discourse level and the lower scores at the fragment level for both the Verbatim and Form Class responses. Differences of a similar nature were found for the Verbatim given Form Class responses, but these did not reach significance.

Sex. The tenability of this exploratory hypothesis of no differences had to be accepted for all of the criterion scores on all levels of contextual constraint and for all subjects.

Physical Status of Hearing. The hypothesis of no differences between the mean criterion scores of the experimental and comparison groups across all levels of context and sex was rejected for the Verbatim and Forms Class scores only. It was again found, however, that the Verbatim given Form Class scores failed to produce significant differences.

The results indicated that the relative redundancy of the grammatical and semantic cues of the stimulus materials greatly affected those areas of grammatical competence as assessed by the cloze scores of Verbatim and Form Class responses. It is quite difficult, however, to find a convincing interpretation for the negative phenomenon produced by the Verbatim given Form Class scores. One possible explanation was that the Verbatim completions did not improve at any arithmetical rate proportionately faster than the Form Class completions. Another explanation was suggested by intimating the presence of a confounding factor such as the relative redundancy of both the syntactic and semantic cues inherent in the stimulus materials. Further controlled experimentation is needed to test for the effect of the relative redundancy of syntactic and semantic cues within various levels of contextual constraint.[1]

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[1] Dissertation Abstracts International A: The Humanities and Social Sciences (Ann Arbor, Michigan: University Microfilms, 1970), Vol. 31, No. 5, p. 2218-A. (Order No. 70-21,014, 104 pages).

MOORES, DONALD FREDERICK. "APPLICATIONS OF 'CLOZE' PROCEDURES TO THE ASSESSMENT OF PSYCHOLINGUISTIC ABILITIES OF THE DEAF." UNPUBLISHED PH.D. DISSERTATION, UNIVERSITY OF ILLINOIS, 1967.

Purpose: Traditional methods employed in the measurement of grammatical and semantic abilities of the deaf, typically analysis of written language samples and the use of reading scores on standardized achievement tests, have been shown to suffer from fundamental inadequacies. The study was designed to investigate the ability of "cloze" procedures to identify and isolate morphological syntactic, and semantic differences between a deaf group and a hearing group matched on the basis of reading scores on a standardized achievement test. Based on the contention that standardized tests provide spuriously inflated estimates of the grammatical and semantic abilities of the deaf, it was hypothesized that hearing students, matched to deaf subjects on the basis of reading scores, actually possess superior psycholinguistic abilities in all areas and that their superiority would be exhibited through various applications of "cloze" techniques.

Principles, Concepts, or Procedures: The experimental group consisted of 37 residential school deaf children with a mean grade reading score of 4.77 on the Stanford Achievement Test and an average age of 16 years nine months. The control group, 37 fourth and fifth grade hearing students, had a mean grade reading achievement score of 4.84 and an average age of nine years, 10 months. A contrast group of 24 high school hearing students was used for purposes of comparison but their scores were not used in the statistical analyses.

Passages of 250 words were chosen from a fourth, sixth, and eighth grade reading book. Every fifth word was deleted and subjects were instructed to fill in the most appropriate words. Responses were scored for (a) verbatim reproduction, (b) form class (grammatical) reproduction, and (c) verbatim given form class reproduction--the percentage of correct verbatim responses given correct form class reproduction.

Conclusions: Verbatim. The performance of the control group was superior ($p. < .001$) and the superiority existed for each passage, supporting the argument that standardized reading scores over-estimate psycholinguistic abilities of the deaf.

Form Class. The scores of the control group were superior on this measure ($p. < .01$) and the superiority existed for all passages but did not reach significance for the eighth grade test ($.10 > p. > .05$). The results suggest that at least part of the inferiority of the deaf may be explained in terms of inadequately developed morphologico-syntactic integrations.

Verbatim Given Form Class. The scores of the control group on this measure were significantly higher ($p. < .001$) and the superiority existed for each passage. It is concluded that in addition to the poorly developed grammatical abilities identified in the form class measure, the deaf are further handicapped by semantic insufficiencies in the form of redundant, stereotyped modes of expression and limited vocabulary.

The results indicate that "cloze" procedures possess a sensitivity to morphological, syntactic, and semantic abilities which standardized tests are incapable of measuring. Further uses of "cloze" procedures could identify patterns of psycholinguistic strengths and weaknesses and have implications for revisions in the teaching of language to the deaf. The use of "close" procedures to develop individual assessment techniques is also suggested. The technique could supplement or replace present methods of language measurement, which are classificatory in nature, and provide the basis for educational diagnosis leading to an individually proscribed program of remediation.[1]

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[1] Dissertation Abstracts A: The Humanities and Social Sciences (Ann Arbor, Michigan: University Microfilms, 1968), Vol. 28, No. 8, p. 3032-A. (Order No. 68-1813, 142 pages).

RAMANAUSKAS, SIGITA ONA. "THE EFFECT OF CONTEXTUAL CONSTRAINTS BEYOND A SENTENCE ON CLOZE RESPONSES OF CHILDREN IN SPECIAL CLASSES FOR THE EDUCABLE MENTALLY RETARDED." UNPUBLISHED PH.D. DISSERTATION, THE UNIVERSITY OF CONNECTICUT, 1971.

Purpose: The author does not state a purpose.

Principles, Concepts, or Procedures: Subjects were 58 educable mentally retarded pupils reading at a grade level equivalent of 2.5 or above on the *Wide Range Achievement Test* and attending junior high special classes in suburban towns. They were administered two cloze tasks constructed from basal reader selections at the 2-2 level. One task consisted of selections containing sentences in the natural order of discourse (NAT). The other task involved materials wherein sentence order was modified by being randomly rearranged (MOD). The two conditions differed in availability of contextual cues beyond a sentence. A Latin Square design was used with repeated measures over type of material (NAT and MOD) and order effect controlled through counterbalancing.

Conclusions: An analysis of variance confirmed ($p < .0005$) the expectation that significantly more correct cloze responses would be produced in the NAT condition. Order of treatment presentation was not significant but a significant ($p < .02$) ordinal interaction was observed between type of material and order. More correct cloze responses were produced when NAT was presented second but the relative effect of NAT and MOD was undisturbed. It was concluded that mentally retarded pupils having the characteristics of the subjects of this study are not word callers or even sentence specific readers at least as measured by the cloze technique using basal series materials. They are responsive to contextual constraints beyond the sentence. Possibilities for future study and educational implications were discussed.[1]

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[1] *Dissertation Abstracts International A: The Humanities and Social Sciences* (Ann Arbor, Michigan: University Microfilms, 1971), Vol. 32, No. 5, p. 2515-A. (Order No. 71-29,900, 80 pages).

RANKIN, EARL F., JR. "READING TEST RELIABILITY AND VALIDITY AS FUNCTION OF INTROVERSION-EXTROVERSION." JOURNAL OF DEVELOPMENTAL READING, 6 (1963), 106-117.

Purpose: The author conducted a series of three studies to determine the relationship between introversion-extroversion and reading test reliability and validity.

Principles, Concepts, or Procedures: Reading comprehension and introversion-extroversion measures were computed for each of the 161 college students participating. Some subjects took a pre-reading cloze test while others took a post-reading cloze test. One article was used in the study.

Conclusions: The fact that pre-cloze tests demand more persistence and greater organizational skill than post-cloze tests may account for the fact that extroverts performed less well than introverts on the pre-cloze test. Post-cloze scores did not differ significantly.

The overall conclusion of the three studies was that a relationship exists between introversion-extroversion and reading test reliability and validity.

SEMMEL, MELVYN I.; BABBITT, LOREN S.; AND BENNETT, STANLEY W. "PERFORMANCE OF EMR AND NONRETARDED CHILDREN ON A MODIFIED CLOZE TASK." AMERICAN JOURNAL OF MENTAL DEFICIENCY, 74 (1970), 681-688.

Purpose: The authors report a study designed to investigate the grammatical ability of educable mentally retarded children.

Principles, Concepts, or Procedures: Two groups of EMR children attending an institution and a public school were matched with two groups of non-retarded children on the basis of intelligence and chronological age.

Forty-four word sentences, utilizing different word orders, were placed on individual cards. One word was omitted from each sentence. A subject was required to replace it orally while the sentence was read by an experimenter and the subject read the card.

Conclusions: EMR children did, in fact, have difficulty with the cloze tasks due probably to weak grammatical decoding structures. The results indicated, however, that language development may be more closely related to chronological age than to mental development.

WEAVER, WENDELL WILLIAM. "AN EXAMINATION OF SOME DIFFERENCES IN ORAL AND WRITTEN LANGUAGE USING THE CLOZE PROCEDURE." UNPUBLISHED ED.D. DISSERTATION, UNIVERSITY OF GEORGIA, 1961.

Purpose: The problem of this study was to determine if differences existed in the ability of subjects to predict words omitted from language materials intended for oral and written presentation. Tests designed in this fashion have been named "cloze" tests.

Principles, Concepts, or Procedures: Two groups of 80 subjects each (Juniors and Seniors at the University of Georgia) were used in this study. The subjects were further sectioned into 16 groups of 10 each and administered 8 "cloze" tests in various orders. The last test given in each instance was the experimental test. The "cloze" tests used were constructed by deleting every tenth word from language passages intended for oral and written presentations, and by deleting every tenth noun or main verb in other language passages intended for oral and written presentation.

One group received "cloze" reading tests and cloze aural tests in a multiple-pass situation. That is, they were allowed as many repetitions of the listening materials as they desired. The other group received "cloze" reading tests and "cloze" aural tests in a single-pass situation. They were allowed to hear the aural materials only once.

A 2 X 2 X 4 analysis of variance design was used for the statistical analysis of the data. The multiple-pass and the single-pass situations were analyzed separately.

Conclusions: Although the multiple-pass aural situation increased the predictability of the missing words, the relationships within the two situations were essentially the same. The central finding is that structural meaning, as shown by the predictability of "any-word" cloze, is conveyed significantly better by silent reading while lexical meaning, as shown by the predictability of nouns and main verbs, is conveyed equally well by listening or by silent reading. Whatever advantage allowed the greater predictability of structural meaning in the silent reading situation is in some manner lost in the listening situation.

There are indications that this loss is due to the relatively small context necessary for supplying predictive information in the lexical case in most situations, compared to the relatively larger context needed to supply all the structural meaning available. The fact that large contextual elements can be analyzed only with great difficulty in the listening situation may drive the organism to use the strategy of depending on the small context in both structural and lexical situations, thereby losing the structural meaning which depends upon large context.[1]

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[1] Dissertation Abstracts (Ann Arbor, Michigan: University Microfilms, 1962), Vol. 22, No. 8, p. 2702. (Order No. 61-6587, 147 pages).

WEAVER, WENDELL W., AND BICKLEY, A. C. "SOME DIFFERENCES IN ENCODING AND DECODING MESSAGES." JOURNAL OF THE READING SPECIALIST, 7 (1967), 18-25.

Purpose:

> The purpose of this study is to determine the ability of subjects to predict the omissions from a natural language text which they had previously produced themselves as contrasted with the ability of other subjects to predict omissions from these same texts which they had read at the time of production. (18)

Principles, Concepts, or Procedures: Subjects were 64 randomly selected college sophomores who were randomly assigned to one of two experimental and two control groups. One experimental group produced written stories in response to two Thematic Apperception Test cards and the second group read the stories. Two days later both groups were administered cloze tests which utilized every-seventh-word deletions. One control group also produced stories but did not refer to them again. Subjects read stories written by the experimental group and were administered a cloze test two days later. The second control group was given stories to read followed two days later by cloze tests produced by the experimental group's stories which had not before been seen.

Conclusions: Predictability of missing elements in passages is increased when subjects are sources of the messages as well as destinations.

WEAVER, WENDELL W., AND KINGSTON, ALBERT J. "A FACTOR ANALYSIS OF THE CLOZE PROCEDURE AND OTHER MEASURES OF READING AND LANGUAGE ABILITY." JOURNAL OF COMMUNICATION, 13 (1963), 252-261.

Purpose: "This study explores a number of measures of language ability and attempts to isolate a set of fundamental components." (252)

Principles, Concepts, or Procedures: A battery of eighteen tests was administered to 160 college juniors. The battery comprised:

1. The Davis Reading Test.
2. The MLAT Number Learning Subtest.
3. The MLAT Phonetic Script Subtest.
4. The MLAT Spelling Clues Subtest.
5. The MLAT Words in Sentences Subtest.
6. The MLAT Paired Associates Subtest.
7. STEP Listening Test.
8. The Ohio State Psychological Examination-Vocabulary.
9. The Ohio State Psychological Examination-Word Relations.
10. The Ohio State Psychological Examination-Reading Comprehension.
11. Cloze I - A Structural Deletion of Essay Material (Subject reads).
12. Cloze II - A Lexical Deletion of Essay Material (Subject reads).
13. Cloze III - A Structural Deletion of a Speech (Subject reads).
14. Cloze IV - A Lexical Deletion of a Speech. (Subject reads).
15. Cloze V - A Structural Deletion of Essay Material (Subject listens).
16. Cloze VI - A Lexical Deletion of Essay Material (Subject listens).
17. Cloze VII - A Structural Deletion of a Speech (Subject listens).
18. Cloze VIII - A Lexical Deletion of a Speech (Subject listens).

Each cloze test contained 40 deletions and had a 30 minute time limit. Exact word replacements were required.

Conclusions: Among the conclusions drawn from the analysis was

> . . . that cloze tests of varied kinds are more related to each other than to the other two factors isolated by this analysis, verbal comprehension and "rote memory, flexible retrieval." It is also important to note that there is much specific variance connected with the cloze procedure which is unexplained by this analysis. (261)

WILLIAMS, FREDERICK DOWELL. "AN EXPERIMENTAL APPLICATION OF THE SEMANTIC DIFFERENTIAL AND 'CLOZE' PROCEDURE AS MEASUREMENT TECHNIQUES IN LISTENING COMPREHENSION." UNPUBLISHED PH.D. DISSERTATION, UNIVERSITY OF SOUTHERN CALIFORNIA, 1962.

Purpose: The purpose of this study was to apply two communication research techniques--the semantic differential and cloze procedure--to research in listening comprehension. The semantic differential, a scaling technique, was used as an operational measurement of attitude-toward-topic and as an exploratory measurement of receptivity. Cloze procedure, used as a comprehension measurement, is a technique whereby respondents attempt to replace words that have been systematically deleted from a language sample. All previous reported research with cloze procedure involved its application to written materials. In this study a technique was devised for applying cloze procedure to tape-recorded oral materials.

Principles, Concepts, or Procedures: The problem included (1) investigating relationships among variables in comprehension of two language selections, (2) comparing two comprehension criteria on the basis of a matched group design, (3) seeking additional relationships between attitude measurements and anticipated effects of the persuasive selection, and (4) comparing subjects' evaluations of the two comprehension criteria.

Subjects were used in a two-group (N = 126 and 127). Group I used a multiple-choice test as a comprehension criterion, whereas Group II used cloze procedure. Both groups heard tape-recordings of two selections taken from the Sequential Tests of Educational Progress (listening). Selection A was a persuasive speech on the value of fear. Selection B was an expository lecture on word meanings. Relative to the selections, seven measurements were obtained from subjects in each group: pre-exposure and postexposure (selection A) attitude toward "fear," receptivity and comprehension of selection A, receptivity and comprehension of selection B, and evaluation of the over-all test materials. Language ability scores (American College Testing Program) were obtained for 105 subjects in each group.

Relationships among the foregoing measurements were analyzed by use of the Pearson product-moment statistic. Coefficients were interpreted on the basis of minimum significant r (.05 level).

Conclusions. In listening to the persuasive selection, shift of attitude (difference between pre-exposure and postexposure) measurements for both groups were substantially related to favorability of postexposure attitude. There was also a low correlation between pre- and post-exposure favorability of attitude measurements. Receptivity measurements showed a definite but small relationship with both postexposure attitude and shift of attitude. Both comprehension criteria were substantially related to subjects' ACT scores. But in neither group was the comprehension criterion related to attitude nor receptivity measurements.

In listening to the expository selection both groups' comprehension measurements were slightly correlated with receptivity measurements. Both comprehension measurements were substantially related to subjects' ACT scores.

There was a definite but small relationship between subjects' (Group I) scores on the two multiple-choice tests. Subjects' (Group II) cloze scores on the two selections were highly correlated.

In a matched group design (53 pairs on the bases of sex, ACT score, age, class year), the correlation coefficient between multiple-choice test scores and cloze scores on the persuasive selection was insignificant. On the expository selection the comprehension criteria showed a marked relationship.

Additional relationships between semantic differential measurements and anticipated effects of the persuasive selection included (1) that both groups showed a significant shift in a favorable direction in over-all attitude measurements (sign test) and (2) that both groups' shifts on individual attitude scales were highly related (Spearman rho).

In evaluating the test materials, Group I rated the multiple-choice test as significantly (median test) more favorable on bad-good and hard-easy scales than Group II had rated cloze procedure. There was no significant difference on slow-fast, worthless-worthwhile, and passive-active scales. Neither group rated the test materials in an unfavorable direction on any of the scales.[1]

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[1] Dissertation Abstracts (Ann Arbor, Michigan: University Microfilms, 1963) Vol. 23, No. 7, pp. 2628-2629. (Order No. 62-6091, 219 pages).

CHAPTER V

THE CLOZE PROCEDURE AS AN INSTRUCTIONAL TECHNIQUE

The cloze procedure has been variously applied in the area of educational methodology.

Several studies have investigated the efficacy of using the technique to determine reading levels. Alexander[1] and Guszak[2] assessed the independent, instruction, and frustration reading levels of intermediate grade pupils.

Kirby[3] compared cloze test scores with oral and silent reading scores to determine whether cloze results are accurate determinants of the instructional reading level of elementary school children.

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[1] Henry William Alexander, "An Investigation of the Cloze Procedure as a Measuring Device Designed to Identify the Independent, Instruction, and Frustration Reading Levels of Pupils in the Intermediate Grades" (an unpublished Ed.D. dissertation, University of Illinois, 1968).

[2] Frank J. Guszak, A Comparative Study of the Validity of the Cloze Test and Metropolitan Achievement Test (Reading Comprehension Subtest) for Making Judgments of Instructional Levels (Austin, Texas: University of Texas, 1969.

[3] Clara Lou Laughlin Kirby, "A Comparison of Scores Obtained on Standardized Oral and Silent Reading Tests and a Cloze Test" (unpublished Ed.D. dissertation, Ball State University, 1967).

The validity of using cloze test results as determinants of the reading levels of first grade children who had been taught beginning reading by four different approaches was investigated by Kirchhoff,[1] while Sauer[2] investigated the hypothesis that the cloze technique is a valid determinant of the instructional reading level of disabled fourth grade readers.

Wiechelman[3] compared the functional reading levels identified by cloze tests and by informal reading inventories using eighth grade students as subjects. Ransom[4] also compared cloze test scores and informal reading inventory scores but studied elementary school children.

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[1] Leo Henry Kirchhoff, "A Study Utilizing the Cloze Test Procedure to Determine Reading Levels of First Grade Children Who Have Been Taught Beginning Reading by Four Different Approaches" (unpublished Ed.D. dissertation, University of Kansas, 1968).

[2] Freda Mae Sauer, "The Determination of Reading Instructional Level of Disabled Fourth Grade Readers Utilizing Cloze Testing Procedure" (unpublished Ed.D. dissertation, Oklahoma State University, 1969).

[3] Duane Sylvester Wiechelman, "A Comparison of Cloze Procedure Scores and Informal Reading Inventory Results for Estimating Functional Reading Levels for Students at Eighth Grade Level" (unpublished Ed.D. dissertation, University of Northern Colorado, 1971).

[4] Peggy Elaine Hitchcock Ransom, "A Study to Determine Reading Levels of Elementary School Children by Cloze Testing" (unpublished Ed.D. dissertation, Ball State University, 1965).

Schoelles[1] investigated the cloze procedure as a predictor of reading group placement.

Criterion levels of performance for instructional tasks were developed by Bormuth,[2] and Rankin[3] assessed the grade level interpretation of cloze scores.

Several studies have investigated the use of the cloze procedure as a teaching device. Bloomer[4] employed the cloze procedure as a remedial reading technique for college students. Bloomer[5] also studied the effects of non-overt reinforcement of cloze responses of students at selected grade levels.

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[1] Iris Storey Schoelles, "Cloze as a Predictor of Reading Group Placement" (paper presented at the Annual Meeting of the International Reading Association, Atlantic City, New Jersey, April 19-23, 1971).

[2] Bormuth, Development of Standards of Readability: Toward a Rational Criterion of Passage Performances, Final Report to the Office of Education, Department of Health, Education, and Welfare, Project No. 9-0237 (Chicago: University of Chicago, June 1971).

[3] Rankin, "Grade Level Interpretation of Cloze Readability Scores" (paper presented at the National Reading Conference, St. Petersburg, Florida, December 3-5, 1970.

[4] Richard H. Bloomer, "The Cloze Procedure as a Remedial Reading Exercise," Journal of Developmental Reading, 5 (1962), 173-181.

[5] Bloomer, "The Effects of Non-Overt Reinforced Cloze Procedure Upon Reading Comprehension," New Frontiers in College-Adult Reading, ed. by G. B. Schick and M. M. May, Yearbook of the National Reading Conference (Milwaukee, Wisconsin: National Reading Conference, 1965, pp. 31-40.

After determining the knowledge of grammatical usage of achieving students of English which enabled them to learn material more efficiently than non-achieving students, Blumenfeld and Miller[1] provided instruction to the latter students by means of the cloze procedure.

Guice, Hunter, Smith, and Stewart[2] utilized the cloze procedure as an instructional device to improve the reading comprehension of college students, while Friedman[3] studied its effect on the reading comprehension of foreign college students.

The differential effects of instruction in transformational grammar and the completion of cloze exercises on the reading, writing, and listening of college freshmen were investigated by Martin.[1]

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[1] Jacob P. Blumenfeld and Gerald R. Miller, "Improving Reading Through Teaching Grammatical Constraints," Elementary English, 43 (1966), 752-755.

[2] Billy Milton Guice, "An Experiment Combining Instruction in Comprehension With Practice in the Cloze Procedure in Reading" (unpublished Ed.D. dissertation, University of Southern Mississippi, 1966); Charles F. Hunter, "Clozing the Gap: An Approach to Solving Reading Problems at San Jose City College" (paper presented at the meeting of the Western College Reading Association, Los Angeles, California, April 1-3, 1971); Elmer L. Smith, "Use of the Cloze Procedure in Improving Comprehension of Junior College Readers" (paper presented at the National Reading Conference, Atlanta, Georgia, December 4-6, 1969); Elneita Wallace Stewart, "A Comparative Study of the Effectiveness of Cloze and Textbook Procedures in a College Reading Program" (unpublished Ed.D. dissertation, University of Houston, 1967).

[3] Mildred McElhinney Friedman, "The Use of the Cloze Procedure for Improving the Reading Comprehension of Foreign Students at the University of Florida" (unpublished Ed.D. dissertation, The University of Florida, 1964).

Guscott[2] presented exercises in the form of overhead transparencies to sixth grade students and assessed the effects on reading achievement, and Faubion[3] measured the effect of the cloze procedure on the comprehension of fourth grade students. Hafner[4] and Rankin and Overholser[5] applied the cloze procedure to teaching context aids to intermediate grade children. The effects of cloze exercises on the reading comprehension of sixth grade students was studied by Schneyer.[1]

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[1] Ruby Wheeler Martin, "Transformational Grammar, Cloze, and Performance in College Freshmen" (unpublished Ed.D. dissertation, Syracuse University, 1968).

[2] Charles Edgar Guscott, "The Effect of Cloze Procedure Exercises on the Improvement of Reading Achievement and of Reading Comprehension of Selected Sixth-Grade Students" (unpublished Ph.D. dissertation, The University of Akron, 1971).

[3] Norma Nell Faubion, "The Effect of Training in the Use of Cloze on the Ability of Fourth Grade Pupils to Gain Information From Written Discourse" (unpublished Ph.D. dissertation, Texas A&M University, 1971).

[4] Lawrence Erhardt Hafner, "An Experimental Study of the Effect on Various Reading Achievement Scores of Teaching Selected Context Aids to a Group of Fifth Grade Pupils" (unpublished Ed.D. dissertation, University of Missouri, 1960).

[5] Earl F. Rankin and Betsy M. Overholser, "Reaction of Intermediate Grade Children to Contextual Clues," Journal of Reading, 1 (1969), 50-73.

Robinson[2] made use of the technique with functionally illiterate inmates of a federal penitentiary. The potential uses of the cloze procedure in reading clinics have been described by Rankin.[3]

Jongsma,[4] in a review of the literature related to the cloze procedure as a teaching device, offered suggestions for future research.

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[1] J. Wesley Schneyer, "Use of the Cloze Procedure for Improving Reading Comprehension," The Reading Teacher, 19 (1965), 174-179.

[2] Richard David Robinson, "An Investigation Into the Use of the Cloze Procedure With a Group of Functionally Illiterate Adults" (unpublished Ed.D. dissertation, University of Georgia, 1971).

[3] Rankin, "Uses of the Cloze Procedure in the Reading Clinic," Reading in a Changing Society, ed. by J. Allen Figurel, Proceedings of the International Reading Association (New York: Scholastic Magazines, 1959), pp. 228-232.

[4] Eugene Jongsma, The Cloze Procedure as a Teaching Technique (Newark, Delaware: International Reading Association, 1971).

ALEXANDER, HENRY WILLIAM. "AN INVESTIGATION OF THE CLOZE PROCEDURE AS A MEASURING DEVICE DESIGNED TO IDENTIFY THE INDEPENDENT, INSTRUCTION, AND FRUSTRATION READING LEVELS OF PUPILS IN THE INTERMEDIATE GRADES." AN UNPUBLISHED ED.D. DISSERTATION, UNIVERSITY OF ILLINOIS, 1968.

Purpose: Identification of a pupil's independent, instructional and frustration reading levels are essential if academic progress, commensurate with aptitude, is to occur. Standardized reading tests have been found ineffective in providing this basic information. The informal reading inventory, if properly constructed and administered, will provide an examiner with this data, however, it must be given individually thereby precluding extensive usage for purposes of reading evaluation.

The purpose of this study was to determine if a test predicated on the Cloze procedure (a word deletion system) could provide basic information similar to that obtained with the informal reading inventory. Because a cloze test samples both lexical and structural language factors, two components of reading comprehension, it appeared logical to propose such hypothesis. Secondly, the study permitted consideration of the relationship of scores obtained with the two informal reading tests and those derived with the standardized reading test and the intelligence measure.

Principles, Concepts, or Procedures: A total of 365 students somewhat equally distributed among the three levels of the intermediate grades of a suburban elementary school system near the City of Chicago were the subjects utilized in this study. The numerical division of sexes was almost equal although slightly favoring males. Each student was administered the Lorge-Thorndike Intelligence Test Multi-Level edition, the Gates-MacGinitie Reading Tests - Survey D, an informal reading inventory predicated on the Powell paradigm, and a cloze test. These were administered in the same sequence as just presented. The reading passages used in the construction of the informal reading inventory and the cloze test were identical. At least one week elapsed between administration of the two informal tests. All examinations were completed during the month of February, 1968.

A total of seventeen passages extracted from the Scott

Foresman, The New Basic Readers: Curriculum Foundation Series (1965) provided the basis of constructing the informal reading inventory and the cloze test. The reading difficulty level of the passages ranged from grade 1.6 to 9.9 with approximately .6 grade difference between each passage. The readability level of those passages taken from basals below grade four was determined through the application of the Spache Readability formula, and the excerpts taken from basals designed for use above grade three were analyzed with the Dale-Chall Readability formula.

Conclusions: Based on the statistical analysis it was possible to conclude that a measuring instrument predicated on the Cloze procedure can be expected to identify the independent, instructional and frustration reading levels with a degree of accuracy comparable to that obtainable with a properly constructed and administered informal reading inventory when the subjects are elementary school intermediate grade pupils. Cloze percentage scores below 47% were found to identify the frustration reading level; scores ranging between 47% and 61% demarcated the instructional reading level with the maximum indicated by the ratio identical with smallest of these polarities; and the independent reading stratum was identified when the percentage exceeded 61.

Furthermore, cloze test scores correlated with outcomes of a standardized reading test and an intelligence scale as well as the correlations of the informal reading test with the same measurement instruments.

Recommendations:

1) Cloze tests can be employed by teachers to identify the independent, instructional and frustration reading levels of pupils in the intermediate grades of the elementary school.

2) The cloze percentage criteria of 62% plus - independent level; 47% through 61% - instructional level; and less than 47% - frustration level should be employed as only one set of reference points. Other ratios might be suggested on the basis of classroom examination.[1]

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[1] Dissertation Abstracts A: The Humanities and Social Sciences (Ann Arbor, Michigan: University Microfilms, 1969), Vol. 29, No. 12, Part 1, pp. 4314-A, 4315-A. (Order No. 69-10,625, 253 pages).

BLOOMER, RICHARD H. "THE CLOZE PROCEDURE AS A REMEDIAL READING EXERCISE." JOURNAL OF DEVELOPMENTAL READING, 5 (1962), 173-181.

Purpose: The use of the cloze procedure as a remedial reading technique for college students was investigated.

Principles, Concepts, or Procedures: Subjects were two groups of 44 students each, who were randomly selected from volunteers.

Materials for the experimental group were developed from elementary basal readers. Every-tenth-word deletions were used. The materials were levelled and sequenced in a way which allowed students to complete the program in as few as ten or as many as fifty class meetings. Both students and instructor corrected the exercises, and both exact-word and synonym replacements were accepted.

The control group used Gilbert's Power and Speed in Reading for two one-hour sessions each week. In both groups, attempts were made to control the teacher variable by assigning the instructors invigilating roles.

Conclusions: The cloze procedure produced a significant increase in reading comprehension and was found to be highly motivating.

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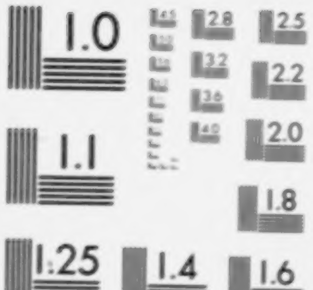
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

BLOOMER, RICHARD H. "THE EFFECTS OF NON-OVERT REINFORCED CLOZE PROCEDURE UPON READING COMPREHENSION." NEW FRONTIERS IN COLLEGE-ADULT READING. EDITED BY G. B. SCHICK AND M. M. MAY. YEARBOOK OF THE NATIONAL READING CONFERENCE. MILWAUKEE, WISCONSIN: NATIONAL READING CONFERENCE, 1965, 31-40.

Purpose: The author describes the third in a series of studies which was designed to compare fifth, seventh, ninth, and eleventh grade boys and girls and the long-term recall of cloze materials made with various syntactical deletions against straight reading material and random cloze.

Principles, Concepts, or Procedures: Subjects were 1411 pupils from a regional school in upstate New York. Twenty-four 600-word passages were prepared and adjusted to the fifth grade reading level by the Yoakum Readability Formula. Twelve comprehension questions were prepared for each passage. Each passage was prepared in seven cloze forms deleting no words, random words, nouns, verbs, adjectives, pronouns and conjunctions, and noun determiners.

Each student was required to read six of the selections, complete the deletions where appropriate, and answer the questions. The subjects graded their own work. The study lasted three weeks.

Conclusions:

1. . . . higher grade pupils confronted with material of extreme simplicity, . . . , could not derive sufficient self-reinforcement from reading the material or completing the cloze exercises to comprehend at a level better than that of the ninth grade. (38)
2. . . . , as the material gets relatively more simple, the differences between the sexes seem to disappear, and the tendency for boys' performance to be superior over girls increases. (38)

BLUMENFELD, JACOB P., AND MILLER, GERALD R. "IMPROVING READING THROUGH TEACHING GRAMMATICAL CONSTRAINTS." ELEMENTARY ENGLISH, 43 (1966), 752-755.

Purpose: The authors sought to determine

1. what it was that good students of English did know about grammatical usage and poor students did not which enabled the former to learn material more efficiently,

2. if the poor students would improve after instruction.

Principles, Concepts, or Procedures: A number of college freshmen were administered a series of 36 cloze passages.[1] Although exact replacement scores, synonym scores, and word class scores were completed from the results, only the latter were used in this study. The Davis Reading Test was administered before and after the cloze exercises.

Conclusions:

1. Both good and poor students of English demonstrated a grammatical mastery of the language when the word class results were analyzed.

2. No significant improvement in reading comprehension was in evidence after students had completed the cloze exercises.

3. When students were taught to transform verbs and adjectives into nominalizations, reading scores showed improvement significant at the .05 level.

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[1] The materials are described in G. R. Miller and E. B. Coleman, "A Set of Thirty-Six Prose Passages Calibrated for Complexity," p. 61 of this thesis.

BORMUTH, JOHN R. DEVELOPMENT OF STANDARDS OF READABILITY: TOWARD A RATIONAL CRITERION OF PASSAGE PERFORMANCES. FINAL REPORT TO THE OFFICE OF EDUCATION, DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, PROJECT NO. 9-0237. CHICAGO: UNIVERSITY OF CHICAGO, JUNE 1971.

The author presents a composite of five studies designed

> . . . to develop and demonstrate a model for identifying criterion levels of performance for a particular instructional task. The specific objective was to identify the score on a cloze test that represents the most desirable level of performance on instructional materials. (viii)

Studies I-IV will be reviewed; Study V deals with teachers' ratings rather than an application of the cloze procedure.

STUDY I[1]

Purpose: The purpose of this study was

> . . . to determine how closely, if at all, the regressions between the information gain and cloze measures obtained from different passages resembled each other, and also to examine the shapes of those regressions. (32)

Principles, Concepts, or Procedures: A 52-item cloze test was made over a 263-word passage from a psychology textbook and was administered to 260 students enrolled in grades 3, 5, 7, and 11, as well as sophomore and graduate students for the purpose of matching the subjects by pairs for reading ability.

Five forms of a cloze test were made from each of two passages from the textbook. Every-fifth-word deletions were used, so that all words became items requiring replacement. Two multiple-choice tests were prepared for these same passages.

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[1] See also John R. Bormuth, "Empirical Determination of the Instructional Reading Level," Appendix.

The tests were administered in three sessions over a two-week period. There were no time limits.

Conclusions: Neither of the two regressions fell consistently above the other in the range where comparisons were possible. The shape of the regression curve was approximately similar to a normal ogive curve.

> The fact that the two curves were nearly identical in their parameters indicated that the methods used to construct the comprehension tests were likely to produce tests having at least a useful degree of conformity to the instruction and to measure a fairly uniform set of behaviors across passages. (40)

STUDY II

Purpose: Because of a number of limitations inherent in the design of the first study, further exploratory work was deemed necessary and refinement undertaken.

Principles, Concepts, or Procedures:

> . . . a design was used that permitted all data to be gathered in a single testing session. This was achieved by giving the student a cloze test over one passage and a preference rating scale and pre- and post-comprehension tests made from a second passage of matched difficulty. (47)

The passages were chosen from the Gray Oral Reading Paragraphs (1963 edition). Each test booklet contained cloze and completion tests made over two passages which had been matched for difficulty.

Subjects were 1320 students enrolled in grades 3 through 12 in a suburban community.

Conclusions:

> The really fundamental methodological problem of devising a direct test of the regression identity assumption was not solved and remained unsolved at

> the time this report was being prepared. The substantative problems consisted of determing whether different performance criteria must be derived for students at each grade level and materials at each difficulty level. . . . It was also necessary to make a digression into the study of motivation theory and then to reassess the methods used to measure preferences for materials. (75)
>
> The results clearly indicated that it is necessary to calculate separate performance criterion scores for students at every grade level. (77)
>
> It appeared unnecessary to calculate different criterion scores for different levels of passage difficulty. (77)

STUDY III

Purpose: "This study attempted to obtain regressions that would be useful for at least tentatively identifying performance criterion scores." (79)

Three specific objectives were:

1. . . . to analyze and model the concept of a rationally derived performance criterion. (79)
2. . . . to further analyze the preference ratings of passages and to obtain the regressions of those ratings and of information gain scores on cloze scores. (79)
3. . . . to further develop the procedures for constructing comprehension tests. (79)

Principles, Concepts, or Procedures:

> The testing design used in the preceding study proved to be highly efficient and so was retained for this study, but with three major alterations. First, each of the four types of tests taken by a student was made from a different passage. . . . The second alteration was to employ passages that could be said to be more

> representative of instructional materials. The third alteration was to employ longer passages and comprehension tests in order to obtain more reliable results on the cloze and information gain tests. (81)

The study

> . . . involved 10 grade levels of students crossed by 8 levels of passage difficulty, with four passages nested within each difficulty level and five cloze test forms nested within each cloze passage. (86)

Each of the 1600 subjects therefore completed different booklets. The study lasted three weeks.

Conclusions: Before the obtained regressions can be applicable, items beyond those in the area of literal comprehension will have to be added.

The preference scales added to this study indicated that a student's willingness to study is greatly influenced by subject matter, style, and passage difficulty as well as the use made of the passage.

STUDY IV

Purpose: The relationship between rate of reading and cloze scores was investigated.

Principles, Concepts, or Procedures: "The materials and procedures followed in this study were nearly identical to those in Study III." (119)

Twenty students at each of three grade levels - 4, 7, and 10 - were subjects.

Conclusions: "The students at the higher grades appeared to show more rapid rates of reading than the students at lower grade levels." (120)

SUMMARY

In assessing the validity of the thirty performance criterion scores produced by the model in its current stage of development, the author underscored three points.

> 1. . . . it appears that the subject matter, style, and willingness to study preference ratings are the dominant variables in determining where the criterion score is set by the model.
>
> 2. . . . the model dictates that as students reach higher grade levels they should be given more difficult materials.
>
> 3. . . . the model generally dictates that students be given easier materials for use in textbook reading than for reference and voluntary reading. (140-141)

FAUBION, NORMA NELL. "THE EFFECT OF TRAINING IN THE USE OF CLOZE ON THE ABILITY OF FOURTH GRADE PUPILS TO GAIN INFORMATION FROM WRITTEN DISCOURSE." UNPUBLISHED PH.D. DISSERTATION, TEXAS A&M UNIVERSITY, 1971.

Purpose: Two experimental groups and a control were employed for this research which was designed to measure the effect of cloze training upon the reading comprehension of fourth grade pupils when the training focused upon the use of structure words and verbalization by students concerning responses to cloze exercises.

Principles, Concepts, or Procedures: Three fourth grade classrooms in an elementary school in South Texas were randomly assigned to the two treatment groups and the control.

Stratified random samples of passages, approximately one hundred words in length, were taken from three social studies textbooks. The passages were assigned to one of two forms of a cloze test of ability to gain information. The two forms were administered to a group of fourth grade students for the purpose of establishing reliability. Reliability scores of .909 and .933 were obtained for Form A and Form B respectively. Stratified random samples from the three textbooks were used to develop a series of ten cloze lessons, each containing two cloze exercises. Half of the exercises utilized the fifth-word deletion pattern and half utilized a structure word deletion pattern.

Pre-test measures of reading comprehension were taken by administering the CTAGI and the Stanford Reading Achievement Test, Form W. The treatment phase covered a period of ten days. Subjects in the control group participated in a daily silent reading lesson based on passages from which the cloze exercises were developed. In experimental A, subjects were given a cloze lesson each day. In addition, the corrected exercises from the previous day were returned and the subjects were requested to note the corrections. This procedure was followed for ten consecutive school days. Subjects in experimental B followed the same procedure as experimental A with one exception. When the corrected cloze lesson was returned, the subjects were encouraged to verbalize about the appropriateness or lack of appropriateness of their responses. Post-test measures of reading comprehension were taken by administering the CTAGI and the Stanford Reading Achievement Test, Form X.

Conclusions: Three null hypotheses were generated as part of the original design of this study. No significant difference was found between students who received training in the use of cloze and students who did not receive training in the use of cloze as measured by the CTAGI, the CTAGI: Structure Words, and by the Stanford Reading Achievement Test. Thus, the three null hypotheses were not rejected. A fourth null hypothesis was generated: that there would be no significant difference in performance between students who received training in the use of cloze and those who did not receive training as measured by the CTAGI: Lexical Words. A significant difference was found at the .05 level of confidence. This resulted in the rejection of the fourth hypothesis.

Although the researcher was unable to demonstrate that training in the use of cloze resulted in growth in comprehension skills, the study seemed to indicate that there might have been certain variables which influenced the effectiveness of cloze training. It was, therefore, recommended that research efforts be directed toward the identification of the effect of the interaction of such variables as reinforcement, the deletion pattern, and the types of materials utilized for the development of cloze exercises.[1]

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[1] Dissertation Abstracts International A: The Humanities and Social Sciences (Ann Arbor, Michigan: University Microfilms, 1972), Vol. 32, No. 8, p. 4486-A. (Order No. 72-5655, 164 pages).

FRIEDMAN, MILDRED MCELHINNEY. "THE USE OF THE CLOZE PROCEDURE FOR IMPROVING THE READING COMPREHENSION OF FOREIGN STUDENTS AT THE UNIVERSITY OF FLORIDA." UNPUBLISHED ED.D. DISSERTATION, THE UNIVERSITY OF FLORIDA, 1964.

Purpose: Although the need for foreign languages has been increasing vastly, there is as much confusion about the approach to language teaching as there was centuries ago. Throughout its history, the methods and emphases of language teaching have recurred in cycles. The advocates of each method have disregarded the aims of their teaching or accepted the popular method as the panacea. As a result, language teachers are groping for answers. Research is essential to clarify the issues and to improve the results of language teaching.

The purpose of this study was to find another successful method for improving reading comprehension for foreign students. By using the cloze procedure (a word deletion system), it was hoped that simple materials could be made interesting enough for mature students. Because cloze samples both the lexical and structural factors of a language, certain insights into language learning were expected.

Principles, Concepts, or Procedures: Three classes of foreign students in English C-33 and C-34 at the University of Florida were used as subjects one day a week for one trimester. Two classes were given a series of twenty deleted readings, called cloze tests, from McCall Crabbs Standard Test Lessons in Reading, Books A to E (Grades 3 to 7). The other class was given the same readings undeleted. All groups were given a multiple-choice test after each reading.

Conclusions: The design of this study produced data from the pre- and post-test scores from the Metropolitan Achievement Test, Reading Section, Intermediate Level and a vocabulary-in-context test, based on the vocabulary subtest of the MAT, and from the errors on the cloze and multiple-choice tests. The following conclusions were reached from these data.

1. The cloze procedure is as effective in producing improvement in comprehension and vocabulary-in-context as a method using close reading without deletions. The t tests, applied to these changes, indicated that gains were significant for all groups but not between groups.

2. The validity of the cloze procedure as a measure of comprehension for foreign students has been established by its significant correlation with the MAT and the multiple-choice tests.

3. A complete knowledge of the vocabulary is not essential to the understanding of a reading if the subject matter is within the experience of the student. Cloze measures familiarity with the subject as well as the difficulty of the article. This may confuse the readability scores.

The following implications and recommendations were formulated:

1. Since one experimental group made significant gains in vocabulary, the cloze procedure may be superior to the close reading method in improving vocabulary. Further studies should be made in the use of cloze to improve vocabulary.

2. Students report that they are aware of the patterns of the language when they do cloze tests. It is possible that the cloze procedure might be a successful method of teaching and testing structure. Investigations in the relationship of structure to reading would prove most helpful to language teachers.

3. Further study needs to be made on the permanency of the gains with the cloze procedure. It seems quite probable that the need of close observance of language patterns and the development of skill in using context and in finding relationships might establish a more permanent gain than other methods.

4. The influence of personality rigidity upon the results of the cloze procedure and the use of cloze to break the habits of rigidity are factors observed in this study which need further research.[1]

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[1] Dissertation Abstracts (Ann Arbor, Michigan: University Microfilms, 1964), Vol. 25, No. 6, pp. 3420-3421. (Order No. 64-11,533, 124 pages).

GUICE, BILLY MILTON. "AN EXPERIMENT COMBINING INSTRUCTION IN COMPREHENSION WITH PRACTICE IN THE CLOZE PROCEDURE IN READING." UNPUBLISHED ED.D. DISSERTATION, UNIVERSITY OF SOUTHERN MISSISSIPPI, 1966.[1]

Purpose: The problem of this research was to experiment with the cloze procedure as a technique for teaching reading comprehension skills to college students enrolled in an improvement of study course at the University of Southern Mississippi during the winter quarter, 1965-1966.

The purpose of this study was to ascertain whether a group of college students, who received regular instruction in reading comprehension plus instruction in and practice with the cloze procedure, would make significant gains in comprehension when compared with a group of college students who received only regular instruction in comprehension. Some additional information that this study sought to reveal was the relationship between comprehension and successful clozure, creativity and successful clozure, intelligence and successful clozure, and comprehension and creativity.

Principles, Concepts, or Procedures: The Improvement of Study Course was scheduled in two sections, one at 10:00 A.M. and the other met at 1:00 P.M. The lecture sessions for both sections met on every Monday of the quarter. Each of the two lecture sections was broken into two laboratory groups. For the entire quarter, at its respective hour, one laboratory group met on Tuesday and Thursday and the other met on Wednesday and Friday. Each period of work was fifty minutes in duration, three days per week.

Through the use of the table of random numbers and standard randomization procedure, the seventy-six students were randomly assigned to one of the two scheduled lecture sections. The students enrolled in the morning lecture section were further randomly assigned to one of the two morning laboratory groups. Likewise, the students enrolled in the afternoon lecture section were further randomly assigned to one of the two afternoon laboratory groups.

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[1] See also Billy M. Guice, "The Use of the Cloze Procedure for Improving Reading Comprehension of College Students," Appendix.

One morning laboratory group and one afternoon laboratory group were randomly selected as the experimental group. The remaining morning and afternoon laboratory groups were the control group. No student was allowed to change either his lecture section or his laboratory group assignment.

The Cooperative English Tests, Form 1C and Form 1B, Reading Comprehension, The Guilford, Merrifield, and Christensen Test of Creativity "Consequences," and The Guilford, Merrifield, Christensen, and Wilson Test of Creativity "Alternate Uses," Form A, and The Otis Quick-Scoring Test of Mental Abilities were used to collect the data.

The selection of materials used in teaching reading comprehension was based upon the detailed analysis of both forms of The Cooperative English Tests, Reading Comprehension. The course content emphasized the following reading comprehension skills as a result of the analysis of the tests: main ideas, specific details, inferences, conclusions, interpretations.

The series of cloze exercises were based on college level materials from recently published work texts. The cloze deletion technique was applied to each of the selected passages. Each deletion was replaced by an underlined blank space, twelve typewritten spaces wide. The deletion technique employed in the cloze exercises was based on every nth cconcept word--noun, verb, adjective, or adverb as determined by the Department of English, The University of Southern Mississippi.

The cloze passages were given to the students during the laboratory periods and after each exercise was completed, it was scored by the instructor. The exercises were graded allowing two points for a cloze unit and one point for an acceptable clozure synonym. The corrected passage was returned to the student at the following laboratory period.

Conclusions: The data were divided into three parts for treatment. First, the data were entered into a Lindquist Type III analysis of variance. Secondly, Pearson Product-Moment correlation coefficients were computed between comprehension and successful clozure, creativity and successful clozure, intelligence and successful clozure, and comprehension with creativity. Lastly, the data were subjected to a multiple correlation analysis.

The test of pre- post, experimental and control failed to be statistically significant at the .05 level and thus did not support the major hypothesis of this experiment.

An unexpected finding was the statistically significant pre-post-test, time interaction ($P < .01$). The change in pre- and post-test for all groups combined was significant at less than the .01 level. The highest correlation was between creativity and clozure .794 significant at the .01 level of confidence. The correlation between intelligence and creativity was .640 significant at the .01 level. Comprehension and intelligence correlated .636 significant at the .01 level of significance. In assessing the relationship between comprehension and creativity the correlation of .602 was likewise significant at the .01 level. The correlation between intelligence and clozure .400 was significant at the .05 level of significance. The lowest correlation was between comprehension and clozure .203 and was not significant at the .05 level of confidence.[1]

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[1] Dissertation Abstracts A: The Humanities and Social Sciences (Ann Arbor, Michigan: University Microfilms, 1967), Vol. 28, No. 1, p. 143-A. (Order No. 67-8740, 195 pages).

GUSCOTT, CHARLES EDGAR. "THE EFFECT OF CLOZE PROCEDURE EXERCISES ON THE IMPROVEMENT OF READING ACHIEVEMENT AND OF READING COMPREHENSION OF SELECTED SIXTH-GRADE STUDENTS." UNPUBLISHED PH.D. DISSERTATION, THE UNIVERSITY OF AKRON, 1971.

Purpose: The purpose of this investigation was to assess the effect of cloze procedure exercises as defined in the study on selected sixth-grade student's ability to comprehend their assigned social studies text and their performance on a standardized test of reading achievement.

Principles, Concepts, or Procedures: A readability study of the social studies text used by the selected students and a cloze procedure comprehension test using every fifth word deletions demonstrated the need for giving attention to the reading problem. The Dale-Chall formula was used to assess the difficulty of the text. A stratified random sample was drawn from the six selected suburban schools. The sample was drawn on the basis of reading achievement stanine scores. N = 60.

Cloze procedure exercises were constructed using noun determiner deletions. Materials were taken from unfamiliar portions of the social studies text. Exercises were presented in the form of overhead transparencies and numbered answer sheets for a period of eight school weeks.

Post-testing was of two kinds: (1) a cloze procedure test based on unfamiliar social studies material and employing every fifth word deletions, and (2) Iowa Tests of Basic Skills, Reading, Form I.

Conclusions: Employing a 2 x 3 factorial analysis of variance it was found that the cloze exercises did produce significantly better scores on the standardized test of reaching achievement but did not result in significantly better scores on the cloze comprehension test. An analysis of interactions indicated that effect was not related to levels of achievement. It was concluded that cloze exercises as defined in the study had different effects on different levels of reading achievement. Although, on the average, effect on achievement was significant, it was not transferred in a significant way to the functional reading situation by any level.[1]

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[1] Dissertation Abstracts International A: The Humanities and Social Sciences (Ann Arbor, Michigan: University Microfilms, 1972), Vol. 32, No. 7, p. 3861-A. (Order No. 72-4051, 93 pages).

GUSZAK, FRANK J. A COMPARATIVE STUDY OF THE VALIDITY OF THE CLOZE TEST AND METROPOLITAN ACHIEVEMENT TEST (READING COMPREHENSION SUBTEST) FOR MAKING JUDGMENTS OF INSTRUCTIONAL LEVELS. AUSTIN, TEXAS: UNIVERSITY OF TEXAS, 1969.

Purpose: The use of the cloze procedure to determine instructional reading levels for pupils in grades 4, 5, and 6 was investigated.

Principles, Concepts, or Procedures: For each grade, 50 subjects were selected who, on the basis of teacher judgment, were reading at their respective grade levels. The Botel Reading Inventory, Form A (Word Opposites) served as the criterion for instructional level. Compared with the Botel Test scores were scores from three cloze tests for each grade level (below grade level, at grade level, and above grade level) and the scores of the Reading Comprehension subtest of the Metropolitan Achievement Tests.

Conclusions: Findings revealed relatively low correlations (.11 to .18) between the Botel and the cloze tests. The Botel and the Metropolitan tests correlated fairly high at grades 4 and 5 (.49, .21), and showed a statistically significant difference at grade 6. No significant relationships were noted between the cloze test instructional levels and the Metropolitan Test scores. It was suggested that different means of assessing comprehension may have accounted for low correlations between the cloze and the Botel tests. Tables and a bibliography are included.[1]

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[1] Research in Education (Washington, D.C.: United States Government Printing Office, 1970), Vol. 5, No. 9, p. 79. (ED 039 108, 36 pages).

HAFNER, LAWRENCE ERHARDT. "AN EXPERIMENTAL STUDY OF THE EFFECT ON VARIOUS READING ACHIEVEMENT SCORES OF TEACHING SELECTED CONTEXT AIDS TO A GROUP OF FIFTH GRADE PUPILS." UNPUBLISHED ED.D. DISSERTATION, UNIVERSITY OF MISSOURI, 1960.[1]

Purpose: To evaluate the effects on reading achievement scores of an experimental group of fifth grade pupils of teaching the nature and use of selected context aids. The achievement tests used were designed to measure reading comprehension, vocabulary-in-context, and context comprehension, and to yield a vocabulary-comprehension composite called average reading.

Principles, Concepts, or Procedures:

1. The reading achievement of the experimental group was compared to the reading achievement of two control groups. The experimental group and the control-I group were two fifth grade classes in the same school. The control-II group came from a school located in a more favorable environmental setting.

2. Characteristics of the groups in terms of intelligence and reading achievement were obtained at the beginning of the experiment. The California Test of Mental Maturity, the SRA Reading Test, and the Comprehension "X" Test (constructed by the writer) were used as pre-test instruments. Because of inequalities existing among the groups in intellectual and reading achievement status, the analysis of covariance statistical technique was utilized. A chi-square technique and the "t" test of the significance of the difference between means were also utilized.

3. The experimental variable was instruction in the use of these selected context aids: contrast, explanatory words and phrases, and two inferential aids. Instruction was given for three thirty-five minute periods per week for a total of four weeks.

4. At the end of four weeks the pupils of all the groups were administered an alternate form of the reading achievement tests.

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[1] See also Lawrence E. Hafner, "A One-Month Experiment in Teaching Context Aids in Fifth Grade," Appendix.

. . . .

Conclusions:

1. After short term instruction in the use of context aids, none of the comparisons made in the reading achievement areas of comprehension, vocabulary-in-context, average reading, and context comprehension demonstrated unequivocally the influence of the experimental method.

2. Though short term instruction in the use of context aids did not differentiate between the experimental and the control groups in a statistically significant manner, there is a suggestion that it is in the area of vocabulary-in-context achievement that the teaching of context aids would be most productive.

3. In the situation where children were similar in intelligence and background of experience, more of the children who had received instruction in the use of context aids made gains in comprehension than was the case with children who had not received such instruction.[1]

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[1] Dissertation Abstracts (Ann Arbor, Michigan: University Microfilms, 1961), Vol. 21, No. 12, p. 3714. (L. C. Card No. Mic 60-6806, 137 pages).

HUNTER, CHARLES F. "CLOZING THE GAP: AN APPROACH TO SOLVING READING PROBLEMS AT SAN JOSE CITY COLLEGE." PAPER PRESENTED AT THE MEETING OF THE WESTERN COLLEGE READING ASSOCIATION, LOS ANGELES, CALIFORNIA, APRIL 1-3, 1971.

Purpose: The necessity to provide instruction in reading is widespread in community colleges, due primarily to the liberal enrollment policies these colleges generally have.

Principles, Concepts, or Procedures: The program at San Jose City College uses the Davis Reading Test and the Iowa Silent Reading Test as part of its entrance battery and assigns students to either regular or one of two noncredit, pass-fail, remedial English classes on the basis of scores on the speed section of the Davis test. Regular English instructors, reading teachers, and graduate students in English acting as paraprofessionals teach the remedial reading and writing sections. Emphasis is on skill development, beginning with isolated skill areas and working toward integration of skills in successful critical reading. Machines such as tachistoscopes and language masters supplement class instruction, and the use of clozure activities to strengthen vocabulary and comprehension has been particularly successful.

Conclusions: Evaluation of 310 students in remedial sections in the spring of 1970 showed an average gain of nearly 2 years as measured by the Iowa test. Future plans for the program include extending instruction into various departments of the college. References are included.[1]

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[1] Research in Education (Washington, D.C.: United States Government Printing Office, 1971), Vol. 6, No. 8, p. 70. (ED 049 895, 9 pages).

JONGSMA, EUGENE. THE CLOZE PROCEDURE AS A TEACHING TECHNIQUE.
NEWARK, DELAWARE: INTERNATIONAL READING ASSOCIATION,
1971.

Purpose: The author states three purposes:

1. to review the literature related to the use of cloze as a teaching technique.

2. to organize and synthesize the literature.

3. to offer suggestions as to future research.

Principles, Concepts, or Procedures: The work of Bloomer, Friedman, Schneyer, Blumenfeld and Miller, Heitzman and Bloomer, Martin, Guice, Roossinck, and Kingston and Weaver is reviewed.[1]

Jongsma isolates several weaknesses which have been characteristic of many of the studies utilizing cloze as a teaching technique.

1. Lack of direct teaching and over-reliance on pupils' completion of exercises alone.

2. Lack of a lucid definition of the problem.

3. Weak experimental designs.

4. Measurement problems which interfered with true assessment of growth.

5. Inadequate descriptions of studies.

Because of the disparate efforts of the past, Jongsma makes several recommendations for future studies:

1. Development of teaching strategies be they teacher-pupil, small group, or whole class in nature.

2. Investigation of presentation methods
    - complete cloze exercise

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[1] These sources may be found elsewhere in this chapter, except the last two which are listed in Section II of the Appendix.

- complete cloze exercise → answer multiple-choice questions
- read intact passage → complete cloze exercise
- complete pre-close → read passage → complete post-cloze

3. Use of shifting scoring methods wherein grammatical class responses, synonyms, and later exact replacements are requested.

4. More intense and longer studies.

5. Statement of specific, desired outcomes.

6. More attention to the choice of deletion system.

7. Use of cloze in areas such as context clues, vocabulary development, and content reading.

8. Less attention to experimental-control comparisons and more to factorial designs.

9. More attention to randomization.

10. Better measurement procedures.

11. Adherence to guidelines when reporting research.

Conclusions: Because past studies utilizing cloze as a teaching device have failed to significantly improve reading proficiency should encourage future research if errors and inadequacies of the past are ameliorated.

KIRBY, CLARA LOU LAUGHLIN. "A COMPARISON OF SCORES OBTAINED ON STANDARDIZED ORAL AND SILENT READING TESTS AND A CLOZE TEST." UNPUBLISHED ED.D. DISSERTATION, BALL STATE UNIVERSITY, 1967.[1]

Purpose: The purpose of the study was to determine the relationship, if any, that exists between the reading levels of elementary school children as indicated by scores received on a cloze test and scores received on selected oral and silent standardized reading tests.

Principles, Concepts, or Procedures: Related hypotheses were tested to determine if the relationship would be similar for various sub-groups of the sample population. These sub-groups were composed of boys, girls, outstanding readers, able readers, less able readers, high ability students, low ability students, and pupils at each grade level, one through six.

The population for the investigation consisted of 178 elementary school children in grades one through six enrolled in one public school in a Midwestern city. Ninety-eight boys and eighty girls constituted the sample. The mean I.Q. for the group was 101.7.

Instruments employed in the study for comparison purposes included the Gates Reading Tests (Primary, Advanced Primary and Survey), the Gilmore Oral Reading Test, the Gray Oral Reading Test and a cloze test. All were administered within a six-week period beginning February 22, 1965.

Conclusions: Data were analyzed by simple analysis of variance, ratios, *t* tests, and inspection. Problems were stated in terms of null hypotheses and the .01 level of confidence was employed to determine significance of F ratios and *t* tests.

Analysis of data resulted in the following major findings relative to the sample employed in this study:

1. Statistically significant differences existed among means of scores obtained on the cloze test, Gates Reading Tests, Gilmore Oral Reading Test, and the Gray Oral Reading Test for elementary school children in grades one through six.

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[1] See also Clara L. Kirby, "Using the Cloze Procedure as a Testing Technique," Appendix.

2. There were no statistically significant differences among the means of scores obtained on the four instruments at the fifth and sixth grade levels, for high ability students, and for outstanding readers.

3. Mean scores on the cloze test did not differ significantly from those derived from the Gilmore Oral Reading Test (when the accuracy and comprehension scores were averaged) at any level or for any sub-group.

4. The Gates Reading Tests yielded consistently higher mean scores than did the other three instruments.

5. The Gray Oral Reading Test yielded consistently lower mean scores than did the other three instruments.

Interpretation of findings led to the following major conclusions:

1. The cloze test, Gates Reading Tests, Gilmore Oral Reading Test, and Gray Oral Reading Test do not appraise equivalently the reading attainment of elementary school children in grades one through six.

2. The four instruments do not measure equivalently the reading achievement of pupils for grades one through four, boys, girls, low ability students, able readers, and less able readers.

3. Generally, the four instruments identify reading levels comparably for pupils in the intermediate grades and for superior readers.

4. Within the limits of the study, the cloze test yields reading level scores nearly comparable to those of the Gilmore Oral Reading Test (when word accuracy and comprehension scores are averaged on the Gilmore instrument).

5. As elementary school children develop increased reading skill, the four instruments tend to yield less dissimilar results. The findings of this study indicate that the use of a cloze test by classroom teachers for determining instructional reading levels of children is a promising technique.[1]

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[1] Dissertation Abstracts A: The Humanities and Social Sciences (Ann Arbor, Michigan: University Microfilms, 1968), Vol. 28, No. 11, pp. 4512-4513. (Order No. 68-3243, 125 pages).

KIRCHHOFF, LEO HENRY. "A STUDY UTILIZING THE CLOZE TEST PROCEDURE TO DETERMINE READING LEVELS OF FIRST GRADE CHILDREN WHO HAVE BEEN TAUGHT BEGINNING READING BY FOUR DIFFERENT APPROACHES." UNPUBLISHED ED.D. DISSERTATION, UNIVERSITY OF KANSAS, 1968.

Purpose: The investigation was designed to determine whether or not a significant relationship existed between scores on a cloze test and scores on an Informal Reading Inventory when administered to first grade children who have been taught beginning reading by four different approaches. The four different approaches employed in this study were: Initial Teaching Alphabet, Sullivan Programmed Reading, Linguistics, and Basal.

The 15 hypotheses involved four basic problems: (1) the correlation of reading levels for the entire population on a cloze test and an informal reading inventory, (2) the correlation of reading levels obtained on the cloze test and informal reading inventory for first graders who had been taught by four different approaches to the teaching of beginning reading, (3) the correlations of levels identified on the cloze test and the informal reading inventory for boys and for girls, (4) correlations were determined to find if differences existed among the four different approaches to the teaching of beginning reading regarding eight variables when the measured mental capacity was held constant.

Principles, Concepts, or Procedures: The population consisted of 120 first grade students who were selected at random from four school districts located in Johnson County in the state of Kansas. The four districts identified emphasized a different approach to the teaching of beginning reading. A cloze test, an informal reading inventory, a silent reading test, and an intelligence test were used in the investigation. All testing was completed near the end of the first grade year during a five week period.

Coefficient correlations were used to compare three reading levels, independent, instructional, and frustration. These levels were determined from pupil responses on the cloze test and the informal reading inventory.

Conclusions: The reading levels derived from the use of the cloze test correlated with the informal reading inventory at the .05 level of confidence for the total population in first grade.

The instructional and frustration reading level results were significantly correlated at the .05 level of confidence for all first grade students who had been taught beginning reading by four different reading approaches. The independent reading level results were significantly correlated at the .05 level of confidence for the first grade students who had been taught beginning reading by the Sullivan Programmed Reading, Linguistics, and Basal. The independent reading level results for the students who had been taught beginning reading by the Initial Teaching Alphabet approach were not significant at the .05 level of confidence. The cloze test and the informal reading inventory, for boys and girls separately, provided statistically significant scores for all reading levels.

As a result of the statistical analysis, utilizing the analysis of covariance, it was concluded that there were no significant differences among the four different approaches to the teaching of beginning reading regarding eight variables.

The correlations between the cloze test scores and the informal reading inventory scores at the instructional and frustration reading levels were statistically significant. This close relationship would tend to indicate that a cloze test could aid the first grade teacher in determining the appropriate reading level for children nearing the end of their first grade experience. Cloze testing can be administered, simultaneously, to an entire class and thereby save time in determining the reading levels of children. The average length of time required for administering the cloze test to first graders, as a group, approached 30 minutes. The cloze procedure is easily administered and interpreted by classroom teachers who have not had special training in test administration.[1]

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[1] Dissertation Abstracts A: The Humanities and Social Sciences (Ann Arbor, Michigan: University Microfilms, 1969), Vol. 29, No. 10, p. 3329-A. (Order No. 68-17,408, 213 pages). /"Gates-MacGinitie Reading Tests" - Form A1, and "The Lorge-Thorndike Intelligence Tests," Level 1 and 2, Form A, following page 204 not microfilmed at request of author. Available for consultation at University of Kansas Library/.

MARTIN, RUBY WHEELER. "TRANSFORMATIONAL GRAMMAR, CLOZE, AND
PERFORMANCE IN COLLEGE FRESHMEN." UNPUBLISHED ED.D. DISSERTATION, SYRACUSE UNIVERSITY, 1968.

Purpose: This study was designed to examine the relative effectiveness of two experimental programs in improving the language arts skills of a group of Negro college freshmen. The two programs were taught as a part of a freshman course in English. The two experimental treatments--instruction in transformational grammar and the completion of cloze exercises--were administered to comparable groups of Negro college freshmen, and their pre-treatment and post-treatment scores on reading, writing, and listening are compared to determine gains made and significance of difference between gains made in language arts skills.

Principles, Concepts, or Procedures: This study was conducted at South Carolina State College in Orangeburg, South Carolina during the 1966-67 school year. The one hundred students which comprised the treatment groups were selected from the four hundred fifty freshmen registered at State College during the experimental year. In addition, forty-two freshman students provided the population with which the basic competencies of the treatment groups were compared on several measures.

During the experimental period, one treatment group devoted eighteen sessions to transformational grammar. The other group devoted eighteen sessions to completion of cloze exercises. The nontreatment group followed the regular syllabus for Freshman English and Composition. Instructors were regular teachers of English in the Communications Center, South Carolina State College. Criterion measures were the Iowa Silent Reading Tests, the STEP Writing Test, Writing Sample, the STEP Listening Test, and the Delancey Test of Linguistic Structures.

Conclusions: The two treatments produced significant differential gains on pre- and post-test measures of reading, writing, listening, and recognition of linguistic structures. It was found that gains made in reading, writing, listening, and recognition of linguistic structures were not significantly different. Therefore, neither experimental treatment was superior to the other for these variables.

When treatment groups were compared on writing ability with a comparable nontreatment group, it was found that both treatment groups were superior to the nontreatment group. No significant difference was found for the three groups on total English achievement as measured by the Cooperative English Tests. A comparison of the two treatment groups with the nontreatment group on listening revealed a significant F. In this analysis the cloze group was favored with the highest mean score.[1]

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[1] Dissertation Abstracts International A: The Humanities and Social Sciences (Ann Arbor, Michigan: University Microfilms, 1969), Vol. 30, No. 1, p. 70-A. (Order No. 69-8659, 103 pages). /Appendix B: Measuring Instruments, pages 80-90, and Appendices D and E: Experimental Materials, pages 105-279, not microfilmed at request of author. Available for consultation at Syracuse University Library/.

RANKIN, EARL F. "USES OF THE CLOZE PROCEDURE IN THE READING CLINIC." READING IN A CHANGING SOCIETY. EDITED BY J. ALLEN FIGUREL. PROCEEDINGS OF THE INTERNATIONAL READING ASSOCIATION. NEW YORK: SCHOLASTIC MAGAZINES, 1959, 228-232.

Purpose: The author describes the clinical utility of the cloze procedure and suggests a way the procedure might be used in a reading clinic.

Principles, Concepts, or Procedures: Rankin asserts that assessment of achievement is possible with cloze, for both content and style would be constant when tests were made over instructional materials.

Cloze exercises are easy to prepare and thus can be more simply adapted to material of interest to the student than other measurement devices.

Cloze assesses readability and yields immediate reinforcement. Answer keys can be used in combination with discussion in this situation.

Vocabulary can be taught by deleting varying word classes.

Conclusions: In the author's view, the cloze procedure has tremendous potential as a diagnostic and remedial tool.

RANKIN, EARL F. "GRADE LEVEL INTERPRETATION OF CLOZE READABILITY SCORES." PAPER PRESENTED AT THE NATIONAL READING CONFERENCE, ST. PETERSBURG, FLORIDA, DECEMBER 3-5, 1970.

Purpose: Two studies were conducted to investigate the use of a technique for providing a grade-level interpretation for cloze readability scores.

Principles, Concepts, or Procedures: In the first study, Bormuth's cloze-test criteria were compared with the results of the Fry and Dale-Chall readability formulae. A total of 133 students in grades 4 to 8 were required to read a 250-word passage with every fifth word deleted. The results indicated a fairly close correspondence between Bormuth's 44 percent criterion for cloze readability analysis and the readability formulae. In the second study, a method devised by the writer was used. The Informal Cloze Readability Inventory (ICRI) uses materials of unknown difficulty to be read by readers of known reading ability in order to evaluate the readability of a book. The ICRI and the Paragraph Meaning subtest of the Stanford Reading Achievement Test were given to groups of six average readers in grades 4 to 6.

Conclusions: When cloze instructional levels were analyzed, they did not appear to be very different from the readability levels as measured by the readability formulae. It was concluded that valid readability assessments can be made using the ICRI based on a small number of subjects. References are included.[1]

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[1] Research in Education (Washington, D.C.: United States Government Printing Office, 1971), Vol. 6, No. 5, p. 110. (ED 046 657, 12 pages).

RANKIN, EARL F., AND OVERHOLSER, BETSY M. "REACTION OF INTERMEDIATE GRADE CHILDREN TO CONTEXTUAL CLUES." JOURNAL OF READING, 1 (1969), 50-73.

Purpose: This study investigated ". . . the sensitivity of intermediate grade pupils to contextual clues described by Ames' (1965) Classification Schema of Contextual Aids." (50)

Principles, Concepts, or Procedures: Two hundred eight intermediate grade pupils were administered The Context Test which was based on fourth grade basals not used by the pupils. The test utilized the cloze procedure by deleting nouns, adjectives, adverbs, and verbs from their contexts in accord with Ames' schema. Each subject completed a test in about one hour of each of three consecutive days. Synonyms were accepted if tense and grammatical structure were correct.

Conclusions: Among the findings were the following:

1. The difference in difficulty among the contextual clues were significant for intermediate grade children.

2. The rank order of difficulty among clues was highly consistent among both grade levels and reading levels.

3. Reading ability is highly predictive of ability to use the context clues studied here.

4. Question-answer, comparison-contrast, main idea-supporting details, and non-restrictive clauses (appositive phrases) were most difficult for the subjects.

RANSOM, PEGGY ELAINE HITCHCOCK. "A STUDY TO DETERMINE READING LEVELS OF ELEMENTARY SCHOOL CHILDREN BY CLOZE TESTING." UNPUBLISHED ED.D. DISSERTATION, BALL STATE UNIVERSITY, 1965.[1]

Purpose: The study was designed to determine whether or not a significant relationship exists between scores on a Cloze Test and scores on an Informal Reading Inventory.

The nine hypotheses involved three basic problems: (1) the correlation of reading levels for the entire population on a Cloze Test and from an Informal Reading Inventory, (2) the correlation of reading levels obtained at each grade, one through six, on a Cloze Test and from an Informal Reading Inventory, and (3) the correlation of levels identified on the Cloze Test and the Informal Reading Inventory for boys and for girls.

Principles, Concepts, or Procedures: The population consisted of 178 students in grades one through six, in a Muncie, Indiana elementary school. An Informal Reading Inventory and a Cloze Test were constructed for use in the study. A silent reading test and an intelligence test were administered to the group to ascertain normalcy of the sample. All testing was completed in a six week period.

Two sets of criteria were used in identifying levels from the Cloze Test. These were the 50/30/20 criteria and the raw-score criteria. Coefficient correlations were used to compare three reading levels, Independent, Instructional, and Frustration. These levels were determined from pupil responses on the Cloze Test and the Informal Reading Inventory.

Conclusions: The Independent, Instructional, and Frustration reading levels derived from the use of the Cloze Test (using both sets of established criteria) correlated with the Informal Reading Inventory at the .01 level of confidence for the total population in grades one through six.

For pupils in the first grade, the relationship between the results from the Cloze Test and the Informal Reading Inventory was found to be not statistically significant.

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[1] See also Peggy E. Ransom, "Determining Reading Levels of Elementary School Children by Cloze Testing," Appendix.

The Instructional and Frustration reading levels were found to be correlated at the .01 level of confidence in grades two through six, respectively.

Only at fourth grade was the Independent reading level determined from the two test methods (using Cloze Test 50/30/20 criteria) statistically significant.

For the boys scores at the Independent, Instructional, and Frustration reading levels derived from the Cloze Test (both sets of criteria) displayed correlations to the .01 confidence level with results from the Informal Reading Inventory.

Reading level scores derived for the girls' at the Instructional and Frustration reading levels, between the Cloze Test (both sets of criteria) and the Informal Reading Inventory, were correlated at the .01 level of significance. At the Independent reading level the .01 level of confidence was established with the Cloze Test 50/30/20 criteria, but not with the Cloze Test raw-score criteria.

The correlations between the Cloze Test scores and the Informal Reading Inventory scores at the Instructional and Frustration reading levels, grades two through six, were statistically significant. This relationship indicated that a Cloze Test could aid the teacher in determining the appropriate Instructional reading level for children in a classroom for these grades when administered at the beginning of the school year. The Cloze Test also would indicate the level of material which would be frustrating for children in these classes.

First grade performance on the two tests yielded no statistically significant relationship. A higher correlation might have occurred had the testing been administered nearer the end of the school year.

The Cloze Test 50/30/20 criteria, based on percentages of correct responses, proved to be a more accurate indicator than the raw-score criteria.

Cloze testing which can be administered to an entire class saves time. The average length of time required for administering the test to the group in this study was forty minutes. The instrument is easily applied and can be interpreted by qualified teachers who have had no special training in test administration. It was concluded that the Cloze Test can provide a more efficient procedure for identifying Instructional and Frustration reading levels in the elementary schools.[1]

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[1] Dissertation Abstracts (Ann Arbor, Michigan: University Microfilms, 1966), Vol. 26, No. 7, pp. 3705-3706. (Order No. 65-13,038, 133 pages).

ROBINSON, RICHARD DAVID. "AN INVESTIGATION INTO THE USE OF THE CLOZE PROCEDURE WITH A GROUP OF FUNCTIONALLY ILLITERATE ADULTS." UNPUBLISHED ED.D. DISSERTATION, UNIVERSITY OF GEORGIA, 1971.

Purpose: The purpose of this study was to investigate the use of the cloze procedure with a group of functionally illiterate adults. Several segments of this problem were investigated. First, the study sought to test three types of cloze construction as predictors of a standardized reading test. Second, the cloze procedure was tested against several readability formulas in ranking seven reading passages. The third purpose was the gathering of information on the opinions of cloze held by this population.

Principles, Concepts, or Procedures: The sample for the study consisted of 57 inmates of the United States Federal Penitentiary in Atlanta, Georgia. Test scores collected for use in this research included results from the Paragraph Meaning and Word Meaning subtests of the Stanford Achievement Test. Intelligence was measured by the Revised Beta Examination. Only subjects who scored between grade levels 4.0 and 7.9 and had an intelligence score of 90 or above were included.

In addition to these standardized tests, three instruments were used to measure various aspects of the cloze procedure. The first test was developed to evaluate three different types of cloze construction as predictors of a standardized reading test. The various cloze deletion methods included: 1-5 deletion, noun-verb deletion and multiple-choice deletion. The second test consisted of seven passages which were ranked by cloze and various readability formulas. The third instrument was a cloze opinion survey.

Data taken from these tests were treated statistically by the use of simple correlation, stepwise regression analysis, and canonical correlation.

Conclusions: A positive and significant relationship was found between cloze 1-5 deletion and the subtests, Paragraph Meaning and Word Meaning, taken from the Stanford Achievement Test. In addition, multiple regression analysis indicated that 1-5 deletion was also a significant predictor of the same subtests. The canonical correlation gave added weight to the use of the 1-5 cloze deletion technique. The implication of these findings is that in this population, or in ones similar, the 1-5 cloze deletion may predict certain reading abilities as well as standardized testing.

A rank order correlation between the ranking of seven passages by cloze as compared with rankings using readability formulas was not significant. An important finding based on these results is the wide differences between the use of cloze and readability formulas in measuring passage difficulty. Previous research has shown the limitations of selecting material for the illiterate adult based on the use of readability formulas. The selection of the cloze procedure as an alternative seems to have some basis for its use under these circumstances.

The results of the cloze opinion survey indicated a positive feeling toward the cloze procedure. This result should have some bearing on whether a teacher would want to use cloze with a group of functionally illiterate adults. Additional research is needed on this question.[1]

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[1] Dissertation Abstracts International A: The Humanities and Social Sciences (Ann Arbor, Michigan: University Microfilms, 1972), Vol. 32, No. 7, p. 3572-A. (Order No. 72-2535, 157 pages).

SAUER, FREDA MAE. "THE DETERMINATION OF READING INSTRUCTIONAL LEVEL OF DISABLED FOURTH GRADE READERS UTILIZING CLOZE TESTING PROCEDURE." UNPUBLISHED ED.D. DISSERTATION, OKLAHOMA STATE UNIVERSITY, 1969.

Purpose: The primary objective of this study was to determine whether or not Cloze Testing is a valid procedure to determine the instructional grade level of fourth grade disabled readers. This study was one of four, all independent in nature, utilizing the same population to obtain diagnostic information about the reading skills of this particular population.

Principles, Concepts, or Procedures: Data were utilized from a total of 191 fourth grade children selected from the 34 participating schools, both rural and urban, in Kay County, Oklahoma. The Cloze Test was also administered to entire heterogeneous classrooms from the same community, and included 454 children.

A Cloze Test of original materials was prepared specifically for this study. Three stories were composed, sequential in nature, of approximately 200 words per page with the first, second, and third pages written respectively at the 2.0, 2.5, and 3.0 readability levels as measured by the Spache readability formula.

The Reading subtests of the Stanford Achievement Test, Primary II, Form W, were administered to those pupils whose teachers' evaluation placed them in the lower one-third of their class in reading achievement. The Standard Reading Inventory, Form B, was administered to randomly selected pupils with Stanford Reading Test scores from either test ranging between 2.0 and 4.5. Those pupils whose Standard Reading Inventory test scores (evaluated by three reading clinicians) placed them in the instructional grade level range of 1.5 to 3.9 were selected to comprise the population for this particular study.

Statistical Procedure: The procedure for statistical analysis was antecedent probability and psychometric cutting scores and signs. Two conditions for demonstration of practical efficiency of the Cloze instrument were specified. Matching membership scores were the concern.

Conclusions: The statistical procedure consistently rejected the hypotheses that cloze technique is a valid procedure to determine the instructional reading grade level of fourth grade disabled readers. The one exception is to be viewed with skepticism due to the small population.

Recommendations pointed toward cloze research that would analyze the specific kinds of incorrect responses that are made by disabled readers to give guidelines for reading comprehension instruction. It was further recommended that tests be designed that measure the absolutes of a specific reading skill.[1]

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[1] *Dissertation Abstracts International A: The Humanities and Social Sciences* (Ann Arbor, Michigan: University Microfilms, 1971), Vol. 31, No. 8, p. 4046-A. (Order No. 70-21,474, 153 pages).

SCHNEYER, J. WESLEY. "USE OF THE CLOZE PROCEDURE FOR IMPROVING READING COMPREHENSION." THE READING TEACHER, 19 (1965), 174-179.

Purpose: The author reports a study undertaken to investigate the effects of the cloze procedure upon the reading comprehension of sixth grade pupils.

Principles, Concepts, or Procedures: A series of 200-word passages were chosen by the author from a basal reading series. Two types of exercises were prepared. One utilized every-tenth-word deletions regardless of word class while the other deleted noun and verbs only. Twenty deletions were made in each passage. Three exercises of each type were prepared at each reader level: a total of 57 exercises.

There were 32 subjects in the experimental group and 34 in the control group. Measures of reading achievement and intelligence were given through the Gates Reading Survey and the California Test of Mental Maturity.

Conclusions:

1. The experimental group did not show significantly greater improvement in reading comprehension.

2. Scores from both cloze test forms were significantly related to reading comprehension, vocabulary, word recognition, and verbal ability.

The author accounts for the lack of improvement in the experimental group to the absence of discussion following scoring.

SCHOELLES, IRIS STOREY. "CLOZE AS A PREDICTOR OF READING GROUP PLACEMENT." PAPER PRESENTED AT THE ANNUAL MEETING OF THE INTERNATIONAL READING ASSOCIATION, ATLANTIC CITY, NEW JERSEY, APRIL 19-23, 1971.

Purpose: Four questions concerning the relationship between results of cloze test scores and individual reading ability are investigated: (1) Is there a relationship between the cloze results and individual reading ability? (2) Should cloze tests be written at mean grade level? (3) Which provides higher correlations--giving credit for exact responses only or for exact responses and synonyms? and (4) Can the cloze test be considered a valuable part of student reading assessment?

Principles, Concepts, or Procedures: Four hundred and seventy students in grades 1 through 5 at a Snyder, New York, elementary school were administered both the Stanford Achievement Test and cloze passages from basal readers. Correlation of the scores ranged from .64 to .76 using cloze material near the grade mean. It appeared that greater dispersion of the population is achieved through use of more difficult materials. Scoring synonyms and exact words was found desirable.

Conclusions: It was concluded that advantages of the cloze test are (1) that the student must comprehend what he is reading to do well, while random guessing can lead to high scores on the Stanford test and (2) there is no time limit on the cloze, hence the slow, careful reader scores well while the fast random guesser does not. Tables and references are included.[1]

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[1] Research in Education (Washington, D.C.: United States Government Printing Office, 1971), Vol. 6, No. 12, p. 74. (ED 053 868, 6 pages).

SMITH, ELMER L. "USE OF THE CLOZE PROCEDURE IN IMPROVING COMPREHENSION OF JUNIOR COLLEGE READERS." PAPER PRESENTED AT THE NATIONAL READING CONFERENCE, ATLANTA, GEORGIA, DECEMBER 4-6, 1969.

Purpose: Uses of the cloze procedure for both diagnosis and for practice exercises for improving reading comprehension in a junior college reading program are described.

Principles, Concepts, or Procedures: Every tenth concept word--nouns, verbs, adjectives, and adverbs--was omitted from expository prose selections of about 350 words each, and the reader was asked to write the missing word in the blank provided. Following completion of the writing, the teacher and students reviewed the responses orally. An additional procedure was added in which the students looked over the cloze exercise before doing it and noted unfamiliar words.

Conclusions: Use of the cloze procedure was found to be particularly effective for (1) demonstrating the process of comprehension--how words combine with words into wider units of meaning, (2) demonstrating the part grammatical knowledge plays in comprehension, (3) pointing out to students their own deficiencies in the comprehension process, and (4) promoting discussion about particular reading selections and about the process of reasoning which is reading comprehension. References are included.[1]

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[1] Research in Education (Washington, D.C.: United States Government Printing Office, 1970), Vol. 5, No. 9, p. 77. (ED 039 091, 9 pages).

STEWART, ELNEITA WALLACE. "A COMPARATIVE STUDY OF THE EFFECTIVENESS OF CLOZE AND TEXTBOOK PROCEDURES IN A COLLEGE READING PROGRAM." UNPUBLISHED ED.D. DISSERTATION, UNIVERSITY OF HOUSTON, 1967.[1]

Purpose: This study was designed to answer the following questions:

1. Do methods of teaching reading in which cloze procedures are used result in better total reading achievement, comprehension and vocabulary than methods in which reading textbooks are employed?

2. Is growth in total reading achievement, comprehension or vocabulary affected by the age of the learner?

3. Is growth in total reading achievement, comprehension or vocabulary affected by I.Q.?

Principles, Concepts, or Procedures: The experimental method was used to collect the data. Eighty-nine high school graduates who were enrolled in an eight-week English-Mathematics Institute which included a reading program were randomly assigned to two comparison groups.

The 47 students in the experimental group used cloze reading exercises as their chief learning material. The cloze selections were prepared by deleting every fifth word excluding proper nouns, dates and numbers. The selections were taken from the same college reading textbook that the control group used. One illustrated lecture on using one's knowledge of syntax as an aid to reading comprehension was given to the experimental group. The 44 students in the control group used a college reading textbook as their chief learning material.

Both cloze and textbook groups met twice per week in class periods of 55 minutes in length and were taught by the same instructor.

Conclusions: The findings were as follows:

1. The hypothesis that the 47 students who used cloze

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[1] See also Elneita Wallace Stewart, "Reading Improvement Program for College Students," Appendix.

reading materials would experience more growth in reading achievement than the 44 students who used the textbook as the chief learning material was rejected at the five per cent level of confidence.

2. Reading achievement was not affected by age.
3. Reading achievement was not significantly affected by I.Q.

Based on the findings, it was concluded that the cloze procedure was not significantly better than the textbook method. Neither did it prove to be less effective. The small differences in gain in reading achievement favored the cloze group.

In view of the findings, as well as strong support from learning theory, it was recommended that further research should be done on the cloze procedure as a method of teaching reading to college students. It was further recommended that the hypotheses of this study should be experimentally retested with the following alterations in design and procedure:

1. Use matched pairs as subjects.
2. Use cloze reading materials that are designed to enhance conceptual thinking.
3. Use cloze reading materials over a longer period of time.
4. Give subjects in the cloze group more structured instruction on reading comprehension and structural linguistics.[1]

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[1] _Dissertation Abstracts A: The Humanities and Social Sciences_ (Ann Arbor, Michigan: University Microfilms, 1968), Vol. 28, No. 12, Part 1. (Order No. 68-7862, 117 pages).

WIECHELMAN, DUANE SYLVESTER. "A COMPARISON OF CLOZE PROCEDURE SCORES AND INFORMAL READING INVENTORY RESULTS FOR ESTIMATING FUNCTIONAL READING LEVELS FOR STUDENTS AT EIGHTH GRADE LEVEL." UNPUBLISHED ED.D. DISSERTATION, UNIVERSITY OF NORTHERN COLORADO, 1971.

Purpose: The purpose of this study was to compare the functional reading levels identified with a cloze test with the functional levels identified with an Informal Reading Inventory for eighth grade students.

Four major hypotheses were formulated and stated in the null form for the purposes of this study. They were as follows:

Hypothesis 1: There will be no significant relationship between the reading grade levels attained by eighth grade students on a cloze test and on an Informal Reading Inventory for identifying the following:

a) independent reading levels
b) instructional reading levels
c) frustration reading levels

Hypothesis 2: There will be no significant differences between the mean scores attained by eighth grade students on a cloze test and on an Informal Reading Inventory for identifying the following:

a) independent reading levels
b) instructional reading levels
c) frustration reading levels

Hypothesis 3: There will be no significant difference between the mean instructional reading levels attained on a cloze test and on an Informal Reading Inventory by eighth grade students who are reading as follows:

a) at grade placement 7.5 or above
b) below grade placement 7.5

Hypothesis 4: There will be no significant difference between the mean instructional reading levels attained by eighth grade Spanish surnamed students on a cloze test and on an Informal Reading Inventory.

Principles, Concepts, or Procedures: There were seventy-one eighth grade students included in this study, thirteen of whom were Spanish surnamed. A test utilizing the cloze technique was developed for the study. Cloze criteria for functional reading levels were as follows: Independent Reading Level--57 per cent correct responses; Instructional Reading Level--44 per cent but less than 57 per cent correct responses; and, Frustration Reading Level--less than 35 per cent correct responses. An IRI was individually administered to the subjects. Betts' criteria was used to identify functional reading levels.

Correlations were computed between the functional reading levels obtained with the cloze test and the IRI. The Pearson Product-moment measurement was used. Means were computed for the functional reading levels obtained with the cloze test and the IRI. The mean instructional reading levels obtained with the cloze test and the IRI were computed for selected subgroups. The t test for related samples were used to determine the significance of the differences between the means. The .01 level of confidence was used as the criterion for significance.

For descriptive purposes the individual students' functional reading levels identified with the cloze test and the IRI were compared. In addition the reading grade level scores obtained with the Durrell Listening-Reading Series, a standardized test, were compared with the instructional reading levels obtained with the cloze test and the IRI.

Conclusions: On the basis of the findings and the limitations imposed by the study, the following conclusions were drawn:

1. There was a positive relationship between the functional reading levels identified with the cloze test and the IRI.

2. Mean functional reading levels identified through the use of the cloze test for the eighth grade students did approximate their attained mean functional reading levels through the use of the IRI.

3. Even though the variability was greater, the mean instructional reading levels obtained using the cloze test for the eighth grade students reading at grade level 7.5 or above, and below grade level 7.5 did approximate the mean instructional reading levels obtained using the IRI for eighth grade students reading at grade level 7.5 or above, and below grade level 7.5.

4. The mean instructional reading level for the eighth grade Spanish surnamed students which was obtained using the cloze test did approximate their mean instructional reading level obtained using the IRI.

An analysis of the functional reading levels attained by individual students through the use of the cloze test and the IRI revealed that for all comparisons made, there were greater variabilities among the cloze test results than among the IRI results. When compared with the IRI, the cloze test identified individual students' instructional reading levels more accurately than did the Durrell Listening-Reading Test.[1]

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[1] Dissertation Abstracts International A: The Humanities and Social Sciences (Ann Arbor, Michigan: University Microfilms, 1972), Vol. 32, No. 7, pp. 3583-A, 3584-A. (Order No. 72-3317, 205 pages).

APPENDIX

SECTION I

Suggested Readings Related to

"THE CLOZE PROCEDURE: AN OVERVIEW"

1. Bickley, A. C.; Ellington, Billie J.; and Bickley, Rachel T. "The Cloze Procedure: A Conspectus." Journal of Reading Behavior, 2 (1970), 232-249.

2. Green, Richard T. Comprehension in Reading: An Annotated Bibliography. Newark, Delaware: International Reading Association, 1971, 22 pages.

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